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ERRATA.—P. 101, line 15, for "Towlin" read "Tomlin." P. 150, line 27, for "Eviopeltis" read "Eriopeltis"; and line 33, for "Palvinaria" read "Pulvinaria." P. 212, line 2, for "nearly" read "merely." P. 289, line 7, for "under side of the hind wings" read "under side of the right fore wing." P. 290, line 13 from bottom, for "Mr." read "Mrs."

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UNDESCRIBED ORIENTAL RHYNCHOTA.

By W. L. Distant.

Fam. Reduviidæ.

Emesinæ.

Luteva feana, sp. n.

Piceous; anterior lobe and anterior margin of posterior lobe of pronotum, body beneath—excluding apex of abdomen—coxæ, bases and apices of anterior femora and tibiæ, bases of intermediate and posterior femora, luteous; a large spot on corium at base of membrane, and a small apical spot to membrane, cretaceous white. Anterior coxæ considerably passing apex of head; anterior lobe of pronotum glabrous, posterior lobe punctate; basal joint of antennæ luteous at base, about as long as abdomen; anterior femora thickly and finely spinous beneath. Long. 5 millim.

Hab. Burma; Bhamo, Palon (*Fea*).

Nabinæ.

Allœorhynchus marginalis, sp. n.

Head, pronotum, scutellum, and sternum piceous, shining; a lateral spot on each side of scutellum, and the corium, brownish piceous; a spot on apical margin of corium and its apical angle ochraceous; membrane pale piceous, its basal angle narrowly ochraceous; connexivum above and beneath ochraceous, spotted with piceous; abdomen beneath castaneous; legs, rostrum, and antennæ ochraceous, apices of femora and bases of tibiæ brownish ochraceous; second and fourth joints of antennæ about equal in length, third a ittle longer than first; body above finely pilose; anterior and intermediate femora thickly and finely spinous beneath; anterior tibiæ distinctly clavate at apices. Long. 7 millim.

Hab. Burma; Katha (*Fea*).

Allied to *A. nigra*, Walk.

Phorticus cingalensis, sp. n.

Head, scutellum, sternum, and membrane piceous; pronotum and corium dull castaneous; anterior margin of pronotum, a basal spot to corium, connexivum, posterior margin of prosternum, abdomen, legs, and rostrum luteous; antennæ brownish ochraceous, base and apex of third joint luteous; basal joint of antennæ passing apex of head, first and second joints incrassate; pronotum faintly transversely constricted; membrane slightly passing abdominal apex, its apical margin narrowly fuliginous; body distinctly pilose. Long. 2⅔ millim.

Hab. Ceylon (*Lewis*).

LIFE-HISTORY OF *VANESSA ANTIOPA*.

By F. W. Frohawk, M.B.O.U., F.E.S.

(Concluded from vol. xxxv. p. 301.)

After fourth and last moult the larva measures, when fully grown, 2½ in. long, of almost uniform thickness, excepting the first segment, which is much the smallest. The head is bilobed, having a deep notch on the crown, and of a dull black colour, covered with black warts, each emitting a white hair. The segmental divisions are deep, each segment being swollen in the middle, and transversely wrinkled on the posterior half; the spines are long and tapering to a very sharp point, shining black, and bear a number of fine white hairs, each having a black swollen base; the two anterior pairs of dorsal spines are branched, each having two; the first segment is spineless. The arrangement of the spines is as follows: four each on second and third segments—these are the longest spines on the body, and are placed subdorsally and laterally; six each on fourth and fifth, and seven each on all the remaining segments, excepting the last, which has four subdorsal ones, making in all sixty-six spines; from the sixth to eleventh segments (both inclusive) each has a short medio-dorsal spine, which is absent from the rest; the other spines on the fourth to eleventh inclusive form subdorsal, super-spiracular, and sub-spiracular rows. The ground colour is a deep velvety-black, the surface is minutely but roughly granulated, being covered with extremely minute points, and densely sprinkled with pearl-white warts, each emitting a fine white hair, some being of considerable length, and the majority slightly curved; they curve in different directions, giving the larva a soft silky or velvety appearance from the varied play of light falling on the hairs; the segmental divisions are bare, as well as the interstices of the wrinkles, which appear of a deep velvety black; down the centre of the back is a series of rich deep rust-red shield-like markings, which commence on the third segment, and terminate on the eleventh segment, the first being the smallest, and composed of four spots, the two anterior ones are very small, the red runs along each side of the medio-dorsal spine, and behind it in the middle of the red are three black markings; all the red markings have the surface granular like the rest of the body, and scattered with similar hairs, but the base of each is yellowish; in the centre of the anal segment is a shining black dorsal disk, much resembling the head; the spiracles are black and inconspicuous, the legs are black and shining, and the four pairs of middle claspers are a burnt-sienna or rust colour, with a polished band above the feet, which are amply furnished with hooks; the anal pair are black, with pale reddish feet.

The larvæ are gregarious until full-fed; they then become very restless, and crawl rapidly about in search of a suitable place for pupation. The first became full-fed on June 20th, when several started crawling restlessly about. After crawling for five hours, I then enclosed seven of them in a glass-covered box to watch results; after crawling about for another hour, they finally rested close together on the top of the box (inside), and I noticed from time to time they were spinning pads of silk, as well as a layer of silk to rest upon, and, attaching the anal claspers to the pads, they settled down for pupation. Next day one after the other became suspended, and the following day (June 22nd) they all (the seven) pupated.

Like other Vanessidæ larvæ, *antiopa* are very sensitive to any disturbance; any sudden noise sufficient to cause concussion of the air causes the whole brood to give a violent jerk. From this instantaneous movement of several hundred larvæ in a dense mass, the effect is very curious, and, I should think, somewhat alarming to any insectivorous bird that might approach them too closely. This habit exists through all its stages. Whether this is a protective habit or not cannot be said, but the spines in the last two stages, especially after the fourth moult, are so sharply pointed, that I have frequently had them pierce my hands. Therefore, if occasion offered, such efficient weapons of defence would afford considerable protection to the larvæ.

Both sallow and willow are equally suitable food for the larvæ, and birch is readily eaten, even when willow has formed the sole food until the last stage; they will also feed on elm. Nettle, I found, was not appreciated, and not touched by them during the last two or three stages; only when first hatched could I induce them to feed upon it, and, although they lived upon nettle for several days, they did not thrive, and eventually died.

The pupa measures in total length, including the cremaster, from 1 in. to 1¼ in. The average of the male pupa is 1 in., and that of the female 1⅛, but large females are as much as 1¼. Side view: The head is beaked in front, the thorax angular, rising to a pointed dorsal keel, and sloping posteriorly to the sunken metathorax; the abdominal segments rise to the third, then decreasing and curving to the anal segment, which terminates in a long slightly curved cremaster, furnished with an ample cluster of hooks; the ventral surface forms a fairly straight line, except bulging at the apex of the wings. Dorsal view: The head terminates in two well-developed points; there are three points which project laterally on the wing, the first on the base, the second on the inner margin, and the third near the anal angle; between these points the outline is concaved, the abdomen gradually tapers to the anal segment, the cremaster is broad, flattened, rounded at the end, and has a sunken centre. On the fourth, fifth, sixth, seventh, and eighth abdominal segments are a medio-dorsal black point and a subdorsal series of six prominent points, commencing on the second segment, and ending on the seventh segment; those on the eighth and ninth segments are very small, that on the fourth segment is the largest; they have pale bases, black centres, and orange tips; there are also two rows of small black tubercles, the first super-spiracular, the second subspiracular; each row is composed of a single tubercle on each segment; the spiracles are narrow transverse apertures of a dusky colour. The dorsal half of the head and wing points are black, and the ventral half orange. The whole surface is finely and irregularly furrowed and granulated. The ground colour is a pale buff, covered with fine fuscous reticulations. The entire surface is clothed with a whitish powdery substance, giving a pale lilac or pinkish bloom to the pupa, which, however, is easily rubbed off, the pupa then assuming a brownish hue. I found no variation in the colouring of the pupæ; every one of the number —between fifteen hundred and two thousand—was precisely as described.

Immediately the pupa rids itself of the larval skin it is so vigorous in its efforts to anchor the cremastral hooks firmly into the silken pad by its twistings and twirlings, that I have seen them actually tear themselves away and fall to the ground.

From this host of pupæ butterflies commenced emerging during the middle of July, and continued until the middle of August, during which time something over fifteen hundred had emerged. From this large number I selected a good series, showing considerable variation in the colouring of the borders and blue spots, but I did not succeed in obtaining any striking aberration; but the majority of the specimens were very fine, and many exceptionally large, a quantity being of greater size than any in my series of British-caught examples, or any European ones I have seen. The largest of these beautiful insects is a huge female measuring exactly 3¼ in. in expanse.

The colour of the marginal band varies from a pale straw-yellow to a rich deep ochreous or tawny yellow; in some specimens the band is almost plain, being only very faintly and sparsely sprinkled with dusky specks, while others have the bands thickly speckled and almost blotched with black, similar to the North American form. The submarginal series of blue spots vary much in size, and are of two distinct hues; the usual colour is a light, bright, and somewhat metallic blue, and in some examples the spots are a clear metallic lilac. The ground colour is liable to vary from deep purplish black to rich chocolate or deep ruby brown; in some the central portion of the primaries is considerably darker than the rest of the ground colour, forming an indistinct pattern.

I should here mention that the above description of the larvæ is contrary to that given by Buckler, who states that the young larvæ are much more pubescent than when adult, and that the naked spots on the back are green; and of the full-grown larva: "The ventral prolegs are wholly reddish green, . . . the anal pair black, with reddish-green feet." This description must have been from an extraordinary variety of the larva, but I find it copied in the most recent works on the British Butterflies.

ON THE BUTTERFLIES COLLECTED IN EQUATORIAL AFRICA BY CAPTAIN CLEMENT SYKES.

By Emily Mary Sharpe.

(Continued from vol. xxxv. p. 311.)

Family Lemoniidæ.

Libythæinæ.

99. Libythea labdaca, *Westw.* — *a, b.* March from Usoga to Nandi; April, 1900.

100. Abisara delicata, *Lathy*, Trans. Ent. Soc. Lond. 1901, p. 28, pl. iii. fig. 4.—*a.* March from Usoga to Nandi; April, 1900.

Family Lycænidæ.

101. Lachnocnema bibulus (*Fabr.*). — *a, b,* ♂ ♀. Wadelai; January–March, 1900.

102. Oboronia punctatus (*Dewitz*).—*a.* March from Usoga to Nandi; April, 1900.

103. Axiocerses harpax (*Fabr.*).—*a,* ♂. Wadelai; January–March, 1900. *b, c,* ♂ ♀. March from Usoga to Nandi; April, 1900.

104. Chrysophanus abbottii, *Holland.*—*a.* March from Usoga to Nandi; April, 1900.

105. Castalius calice (*Hopff.*).—*a.* Lamogi; November, 1899.

106. Uranothauma falkensteinii (*Dewitz*).—*a*, *b*. March from Usoga to Nandi; April, 1900.

107. Phlyaria cyara (*Hewits.*). — *a*, *b*. March from Usoga to Nandi; April, 1900.

108. Tarucus plinius (*Fabr.*).—*a*. Wadelai; January–March, 1900. *b*. March from Usoga to Nandi; April, 1900.

109. Polyommatus bæticus (*Linn.*).—*a*, ♂. Wadelai; January–March, 1900).

110. Catochrysops patricia (*Trim.*). — *a*, ♀. March from Usoga to Nandi; April, 1900.

111. C. cissus (*Godt.*). — *a*, ♀. March from Usoga to Nandi; April, 1900.

112. C. asopus (*Hopff.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

113. Lycænesthes larydas (*Cram.*). — *a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

114. Zizera gaika (*Trim.*). — *a*, ♂. March from Usoga to Nandi; April, 1900.

115. Hypolycæna antifaunus (*Doubl. & Hewits.*). — *a*, ♀. March from Usoga to Nandi; April, 1900.

116. H. pachalica, *Butl.*—*a*, *b*, ♂. Wadelai; January–March, 1900.

117. H. philippus (*Fabr.*). — *a*, ♀. March from Usoga to Nandi; April, 1900.

118. Virachola antalus (*Hopff.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

119. Tingra amenaida (*Hewits.*). — *a*. Wadelai; January–March, 1900.

120. Tanuetheira prometheus, *H. H. Druce.*—*a*, ♂. Unyoro; March, 1900.

Family Pieridæ.

121. Nychitona immaculata (*Auriv.*). — *a*, *b*. March from Usoga to Nandi; April, 1900.

122. Terias brigitta (*Cram.*).—*a*. Wadelai; January–March, 1900. *b*. March from Usoga to Nandi; April, 1900.

123. T. marshalli, *Butl.*—*a–c*. March from Usoga to Nandi; April, 1900.

124. T. boisduvaliana, *Mab.*—*a*. Lamogi; November, 1899. *b–d*. Wadelai; January–March, 1900. *e*. Unyoro; March, 1900.

125. Pinacopteryx vidua, *Butl.*, P. Z. S. 1899, p. 972, pl. lxx. fig. 8, 9. *a–c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

126. P. pigea (*Boisd.*). — *a*, ♀. March from Usoga to Nandi; April, 1900.

127. GLUTOPHRISSA SABA (*Fabr.*).—*a*, ♀. Wadelai; January–March, 1900. *b*, *c*, ♂. March from Usoga to Nandi; April, 1900.

128. BELENOIS MESENTINA (*Cram.*).—*a*, *b*, ♂. Wadelai; January–March, 1900.

129. B. INFIDA, *Butl.*—*a*, ♀. Wadelai; January–March, 1900. *b–d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

130. B. CRAWHAYI, *Butl.* — *a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

131. B WESTWOODI, *Wallgr.* — *a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

132. B. INSTABILIS, *Butl.* — *a–c*, ♂ ♀. Wadelai; January–March, 1900.

133. B. ? CALYPSO (*Drury*). — *a*, ♂. Unyoro; March, 1900. *b*, ♂. March from Usoga to Nandi; April, 1900.

These two specimens differ from the typical form in having no black spot at the end of the discoidal cell on the primaries of the upper side.

134. B. SOLILUCIS, *Butl.* — *a–d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

135. PHISSURA SYLVIA (*Fabr.*).—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

136. MYLOTHRIS POPPEA (*Godt. nec Cram.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

137. M. AGATHINA (*Cram.*). — *a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

138. M. RUBRICOSTA (*Mab.*).—*a*. Unyoro; March, 1900.

139. M. CHLORIS (*Fabr.*).—*a*, ♀. March from Usoga to Nandi; April, 1900.

140. M. CLARISSA, *Butl.*—*a*, ♀. March from Usoga to Nandi; April, 1900.

141. M. WINTONIANA, *E. M. Sharpe.*— *a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

142. M. JACKSONI, *E. M. Sharpe.*—*a*, ♀. March from Usoga to Nandi; April, 1900.

143. LEUCERONIA PHARIS (*Boisd.*).—*a*, ♀. March from Usoga to Nandi; April, 1900.

144. L. BUQUETTI (*Boisd.*). — *a*, ♂. March from Usoga to Nandi; April, 1900.

145. L. THALASSINA (*Boisd.*). — *a*, ♂. March from Usoga to Nandi; April, 1900.

146. L. ARGIA (*Fabr.*). — *a–c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

147. Eronia leda (*Boisd.*).—*a*, ♀. Wadelai; January–March, 900. *b–d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

148. Colias electra (*Linn.*).—*a–c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

149. Catopsilia florella (*Fabr.*). — *a*, ♂. Lamogi; November, 1899. *b*, ♂. Wadelai; January–March, 1900. *c*, *d*, ♀. March from Usoga to Nandi; April, 1900.

150. Teracolus eris (*Klug*), E. M. Sharpe, Monogr. Teracolus, p. 24 (1898).—*a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

151. T. calais (*Fabr.*), E. M. Sharpe, *t. c.*, p. 1 (1898). – *a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

152. T. phlegyas (*Butl.*), E. M. Sharpe, *t. c.*, p. 61 (1900). — *a*, *b*, ♂ ♀. Wadelai; January–March, 1900. *c*, ♂. March from Usoga to Nandi; April, 1900.

153. T. puniceus (*Butl.*). E. M. Sharpe, *t. c.*, p. 38 (1899).— *a*, ♂. March from Usoga to Nandi; April, 1900.

154. T. protomedia (*Klug*). — *a–c*, ♂ ♀. Wadelai; January–March, 1900.

155. T. antiveppe (*Boisd.*).—*a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

156. T. carteri, *Butl.*—*a–c*, ♂ ♀. Wadelai; January–March, 1900. *d*, ♀. March from Usoga to Nandi; April, 1900.

157. T. xanthus, *Swinh.*, E. M. Sharpe, *t. c.*, p. 153 (1902).

158. T. comptus, *Butl.*, E. M. Sharpe, *t. c.*, p. 153 (1902).— *a*, ♂. Wadelai; January–March, 1900.

159. T. pseudacastis, *Butl.* — *a–e*, ♂ ♀. Wadelai; January–March, 1900. *f*, *g*, ♂ ♀. March from Usoga to Nandi; April, 1900.

160. T. theogone (*Boisd.*).—*a*, ♂. Wadelai; January–March, 1900. *b*, ♂. Unyoro; March, 1900.

161. T. dissociatus, *Butl.*, E. M. Sharpe, *t. c.*, p. 88 (1900).— *a*, *b*, ♂ ♀. Wadelai; January–March, 1900. *c*, *d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

162. T. auriginëus, *Butl.* — *a*, ♀. March from Usoga to Nandi; April, 1900.

163. T. helvolus, *Butl.*—*a*, ♂. March from Usoga to Nandi; April, 1900.

164. Herpænia eriphia (*Godt.*).—*a*, ♂. Unyoro; March, 1900. *b*, *c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. Cameron.

(Concluded from vol. xxxv. p. 315.)

ANTHOPHILA.

Cœlioxys curvispina, sp. nov.

Black; the wings violaceous from the transverse basal nervure; the front, face, and clypeus densely covered with reddish-fulvous pubescence; the scutellar teeth stout, roundly curved on the outer, straight on the inner side, not reaching to the apex of the scutellum. ♀. Long. 18 mm.

Hab. Borneo.

Face coarsely rugosely punctured, the clypeus more closely and not so strongly rugose; the front is distinctly and sharply keeled. The hair on the cheeks is thicker and more rufous in tint than it is on the face or clypeus; on the front it is long and pale, on the clypeus short and white, on the apex of the clypeus it is long, stiff and bright red. Mandibles aciculated at the base; the rest opaque, aciculated, and marked with elongated punctures. Mesonotum rugosely punctured, more closely in the middle at the apex; the scutellum is coarsely rugosely punctured; the lateral teeth are clearly separated beyond their base; the apex of the scutellum is broadly rounded; the postscutellum is smooth and shining in the middle; the sides irregularly, longitudinally striated. Median segment closely punctured, except in the middle at the apex, and thickly covered on the top and sides with long white hairs; the area is aciculated and deeply furrowed in the middle; the furrow is wider and deeper below. Mesopleuræ coarsely rugosely punctured. Legs black, covered with a pale down; the metatarsus thickly covered with fulvous pubescence. The apical part of the wings has brilliant purple tints; the second transverse cubital nervure has the lower two-thirds broadly rounded. The basal five abdominal segments are closely punctured; the basal two not quite so closely as the apical; the basal half of the last segment is coarsely aciculated, and bears also some scattered punctures; the apical is more coarsely aciculated, is opaque, has a stouter keel in the middle, bordered by a firmer one on either side; these become united at the apex; the lower segment is curved, lanceolate, and projects beyond the upper. The segments, above and below, are fringed with soft, white hair.

Comes nearest to *C. fulvifrons*, Sm., from Celebes, the male of which only is known.

The genus *Epeolus* in India.—The genus *Epeolus* is not included in the 'Hymenoptera of British India' by Col. Bingham. When, therefore, I came across a species of the genus from the Bombay district, I naturally concluded that I had got an addition to the Indian fauna. On looking up, however, the literature of the subject, I find that the species—*Epeolus fervidus*, Smith, Descr. of New Species of Hymen. 102—had been already recorded from India—also from the Bombay district—by F. Smith, whose description must have been overlooked by Col. Bingham.

NEW SPECIES OF INDIAN CHRYSIDIDÆ.

By Major C. G. Nurse, Indian Staff Corps.

(Continued from vol. xxxv. p. 308.)

The next seven species are quadridentate, and as the identification of the Indian quadridentate Chrysididæ is by no means easy, I have made out the following key, which should be of assistance in separating them. It will be observed that at least two species, viz. *C. gujaratica* and *C. lucinda*, have the sexes dissimilar, the female only having golden or coppery effulgence. I have taken both sexes of these species under circumstances which leave no doubt as to their affinity:—

- A. Teeth of 3rd abdominal segment more or less acute.
  - *a*. Abdomen with golden or coppery effulgence.
    - a^1. 1st, 2nd, and 3rd segments with golden or coppery effulgence.
      - a^2. Stoutly built; length 7–10 mm.
        - a^3. Thorax bright metallic green ... ... *gujaratica* ♀.
        - b^3. Thorax steel-blue ... ... *cupreiventris*.
      - b^2. More slenderly built; under 7·5 mm.
        - a^3. 1st segment of tarsi very light testaceous ... ... *zobeida*.
        - b^3. 1st segment of tarsi dark reddish black *quettaensis*.
    - b^1. 1st and 2nd segments with golden or coppery effulgence ... ... *lucinda* ♀.
    - c^1. 2nd and 3rd segments with golden or coppery effulgence ... ... *autocrata*.
    - d^1. Two spots on apical segment with golden effulgence ... ... *speculata*.
  - *b*. Abdomen entirely blue or green.
    - a^1. Wings more or less fuscous.
      - a^2. Head smaller than pronotum ... ... *fuscipennis*.
      - b^2. Head as large as pronotum ... ... *cotesi*.
    - b^1. Wings entirely hyaline.
      - a^2. Green or bluish-green.
        - a^3. Stoutly built; length 7–9 mm.
          - a^4. Tegulæ green ... ... *lucinda* ♂.
          - b^4. Tegulæ blue ... ... *gujaratica* ♂.
        - b^3. Slenderly built; under 7 mm.
          - a^4. With subapical foveæ ... ... *balucha*.
          - b^4. Without subapical foveæ ... ... *obliterata*.
      - b^2. Blue or greenish blue.
        - a^3. Head, thorax, and abdomen of equal width.
          - a^4. Lateral teeth of 3rd abdominal segment much shorter than median *bahadur*.
          - b^4. Lateral teeth not much shorter than median ... ... *thalia*.
        - b^3. Head, thorax, and abdomen not of equal width ... ... *seraxensis*.
- B. Teeth of 3rd abdominal segment distinctly blunt... *hoggei*.

CHRYSIS GUJARATICA, n. sp.

♀. Robustly built; head, except clypeus and front, thorax, and abdomen closely, but not very finely punctured, the puncturing of the mesonotum, scutellum, postscutellum, and base of the 1st abdominal segment being somewhat coarser, and less close than on the other portions; head at least as wide as pronotum, and about equal to it in size when viewed from above; clypeus sparsely punctured, rounded and very slightly emarginate anteriorly; 2nd joint of flagellum of antennæ nearly as long as the 3rd and 4th united; a ridge in front of the anterior ocellus, and the front below this ridge forming a sharp angle with the vertex, the front being thickly covered with long snow-white pubescence, which hides the sculpturing; pronotum with the sides parallel, and a median longitudinal depression, which scarcely reaches the apex; mesonotum with two short sublateral longitudinal lines, parallel with the sides of the median quadrate division; first two segments of the abdomen of the same width as the thorax, 3rd segment somewhat narrower, the whole abdomen being nearly as long as the head and thorax united; 3rd abdominal segment rounded, with four sharp teeth, the inner ones the longest; an ill-defined median carina on 2nd and 3rd segments above. Light metallic green, the abdomen, especially on the 2nd and 3rd segments, with a coppery tint; mandibles metallic green at base, light red in the centre, black at apex; antennæ dark red; tarsi testaceous; head, thorax, and abdomen covered with short, sparse, white pubescence; wings hyaline, tegulæ dark shining blue, radial cell of fore wing not quite closed at apex.

♂. Similar, but of a darker green, and without the coppery effulgence; 2nd and 3rd joints of flagellum subequal. Long. 7–9 mm.

Hab. Deesa. I found a large colony of this species about a bank in which two species of *Anthidium* (*A. saltator*, Nurse) and a species which I identify somewhat doubtfully as *A. pulchellum*, Klug, were breeding. I presume that the *Chrysis* is parasitic on one or both of these species. It may be worth noting that I had collected for three years at Deesa before I came across this species, and then found it in large numbers within a mile of my house.

CHRYSIS BAHADUR, n. sp.

♀. Head, thorax, and abdomen closely, but not very finely punctured, and with very sparse greyish pubescence; clypeus sparsely punctured, its apex transverse; an irregularly quadrate enclosure below the anterior ocellus, the front below it being very concave; head wider than pronotum, and, when viewed from above, about half as large again as it; abdomen nearly as long as head and thorax united; a median longitudinal depression on the pronotum, and another on the 1st abdominal segment; 2nd and 3rd abdominal segments with a median longitudinal carina, 3rd segment quadridentate, with subapical foveæ, the teeth sharp, and resembling those of *Stilbum splendidum*. Dark blue-green or green-blue; clypeus and front lighter green; 3rd abdominal segment with a purple tinge; basal two joints of flagellum of antennæ with stiff, white pubescence, remainder of flagellum dark red; tarsi black; wings hyaline, or subhyaline, radial cell closed.

♂. Similar, but of a deeper blue, almost mauve, colour; flagellum of antennæ black. Long. 7–8 mm.

Hab. Kashmir; three specimens obtained at various elevations between 5000 and 9000 ft.

CHRYSIS LUCINDA, n. sp.

♀. Stoutly built, cylindrical; head, thorax, and abdomen closely and regularly, but not very finely punctured; front concave, with stiff white pubescence, which hides the sculpturing; pronotum nearly as large as head, with a median indentation at base; 2nd abdominal segment with a trace of a carina, 3rd segment quadridentate, the teeth acute, with a subapical row of foveæ. Head, thorax, and legs, except the tarsi, metallic green, the central quadrate division of the mesonotum and the joints of the segments inclining to dark blue; 1st and 2nd abdominal segments coppery golden, 3rd segment dark blue, its apex sometimes dark green; antennæ dark rufous; tarsi testaceous; pubescence on head, thorax, abdomen, and legs short and greyish; wings hyaline, fore wing with a very slight fuscous tinge, nervures dark testaceous, tegulæ greenish blue, finely punctured.

♂. Similar; the antennæ lighter rufous; the 1st and 2nd abdominal segments bright metallic green, without any coppery effulgence. Long. 7–8·5 mm.

Hab. Quetta; several specimens.

(To be continued.)

ON A NEW SUBSPECIES OF *ISODEMA ADELMA*, FELD.

By PERCY I. LATHY, F.E.S.

ON comparing some Lepidoptera from Thibet with Chinese forms in Mr. Adams's collection, I noticed among the series of *Isodema adelma*, Feld., an example with an extremely narrow band. I find that this specimen, which came from the Honrath collection, is Felder's type, and bears the locality "Shanghai." This example agrees well with the figure in 'Reise Novaræ,' and I think the Central and Western Chinese and Thibetan forms differ sufficiently to receive a varietal name.

I give below the chief points of difference between this race and the type:—

ISODEMA ADELMA var. LATIFASCIATA, var. nov.

Differs in the much larger cream-coloured patch within cell, the patches between upper median nervule and submedian nervure twice the size of those in typical *adelma;* the submarginal lunules of both wings below not nearly so well developed.

Hab. Central China, Western China, and Thibet.

SOME ACCOUNT OF THE LARVÆ OF *PŒCILOCAMPA POPULI.*

BY JAMES DOUGLAS.

POSSIBLY a few notes on the rearing and changes of the larvæ of *Pœcilocampa populi* may be of interest to your readers, especially as most of the text-books give very imperfect descriptions of these larvæ. I obtained several batches of eggs in December, 1901; the females, unlike those of *Diloba cæruleocephala* or *Trichiura cratægi*, being attracted by light. The eggs were kept in a room facing east, with an occasional fire. This proved rather too warm a temperature, for the larvæ (then 4 mm. long) emerged from March 22nd to April 3rd, to the number of about one hundred. In consequence of this early hatching, and the lateness of the season, I was almost in despair of rearing them, none of their usual food-plants showing even buds; however, I managed to find a Siberian crab with expanded bracts, and on these the larvæ flourished until the apple-trees were sufficiently advanced. The larvæ were then of a dark bluish tint, with short dark hairs, the subdorsal lines orange, and the head much narrower than the first segment. They grew to the length of 10 mm. by April 9th, when they began their first moult. Immediately after this the ground colour, including the head, was light ochre thickly sprinkled with dark purplish-blue dots, black spots in pairs on each segment; subdorsal lines orange, with white spots between the sixth and seventh segments. A few hours later the ground colour became a light bluish grey, and the head black. There were no signs of any red blotches or tubercles. This moulting continued until April 27th, *i. e.* the last larva did not change until six days after the first had completed a second moult, which began on April 21st, and continued until May 15th. In the early days of this stadium the colour was similar to that of the previous one, except that the black spots were not so conspicuous; size 14 mm. Six days after the moult red blotches described in the fifth stadium began to show signs of appearing, the colour being at first dirty yellow; curiously enough, six of the larvæ showed no signs of this change, the blotches remaining black; but I was unable to detect any difference in them after the next moult.

Third moult, May 6th to June 3rd. General colour lighter, and the whole appearance more variegated; marks on the second segment redder; the larvæ, when at rest, having a curiously flattened appearance. Size, May 6th, 25–26 mm.; May 11th, 32–33 mm.

Fourth moult, May 15th to June 15th. Ground colour creamy white, thickly speckled with black; dull red blotch (not tubercle) on second segment on either side of dorsal line; third segment with four, fourth to eleventh segments with five, transverse folds; the posterior three of each more swollen; black dots (larger on fourth fold of each segment) on subdorsal line, with slight surrounding tawny tinge. Size, 51–60 mm.

Change for spinning, June 1st to July 2nd. Ground colour general greyish-blue tinge, shading to green at the head, with tawny suffusion below subdorsal, and two double orange spots on each segment; dorsal line blue, subdorsal orange. This period lasted from four to seven or more days, after which the larvæ spun a very opaque cocoon, varying in colour from a dirty yellow to a very dark brown, according to the character of its surroundings.

It will be noticed that the length of each stadium varied considerably in different individuals, so that some larvæ pupated in at most seventy-five days, whilst others took at least ninety, although they all received exactly the same treatment.

The imagines, the first of which appeared on Nov. 1st, seem, so far as they have yet emerged, to be of a ruddier tinge than the majority of those captured. I have secured a number of fertile ova from several parents, and shall be interested in seeing whether this trait will be accentuated in their progeny if fed on apple, and whether it will disappear if some other food-plant is adopted.

Sherborne, Dorset.

DICYCLA OO IN HUNTINGDONSHIRE, 1902.

By G. Lissant Cox.

During the "Long" this summer I was very successful in getting round our Dean for several "week-end" exeats, and in company with my friend Mr. H. S. Dickson made some delightful flying visits to many places near Cambridge.

I have been interested to see several notes on *Dicycla oo* in the 'Entomologist' for October and November, and perhaps our experiences with this insect in Huntingdonshire may be of some interest.

On the evening of the 13th of July, when we were bicycling to our headquarters for the night, for some unaccountable whim I dismounted and sugared a noble oak—an old friend—and then went on to our destination. We came past the tree at 2 a.m. on our way home, and I boxed an unknown insect, which, except for the inevitable *Xylophasia monoglypha* (*polydon*), was the sole specimen at the treacle. That we should have taken it at such an hour was, as future events proved, an extraordinary piece of good fortune. We showed our captures to Mr. W. Farren, and he was not long in spotting the single *D. oo*, a male in perfect condition, in the midst of a case full of lesser gems. We found that he had seen one about a week previously.

On next Saturday, July 19th, the oaks around "our old friend" (now duly canonised and worshipped!) were all sugared by 7.15 p.m. The day had been warm and sunny. In the evening thick clouds came up which effectually obscured our enemy—the moon. A warm drizzle started at 10.30, and hard rain about an hour later which continued during the night.

The first *D. oo* was boxed by my friend as early as 7.30! One or two came before 8. Then the fun waxed fast and furious. No leisurely walking *now* from tree to tree, but hard sprinting. For some time a lamp was quite unnecessary, as they were so conspicuous; and when at last we lit up, they were much more easily frightened off the trees. Soon after nine they became scarcer, and between 10.30 and 11.30 we only took one specimen. On adding up we found we had forty-five between us, of which thirty-six were females, and only nine males.

Sunday, the 20th, was cold, stormy, and wet. The night was cloudy and inclined to rain, with a north wind. The temperature in many parts of England nearly—if not quite—broke all records for July. Not a promising night for sugar. Yet we took sixteen more *D. oo*: hardly another species was seen. This time the sexes were exactly equal. On one tree I remember there were three. When boxing the lowest, the other two flew away, only to return to their identical positions. The lower one was now boxed, when the other one again made off, and again we found it settled down on the same spot from which it had been frightened twice. A most obliging insect is *D. oo*—sometimes! Nothing was to be seen after 10.30, and, more or less frozen in our thin clothes, we made off for bed.

One in every five was of the variety *renago*, figured in Barrett—a lovely insect. Only forty per cent. of our captures possessed immaculate fringes, but none were actually torn. An unsuccessful attempt was made to obtain ova. Early on Monday we returned to Cambridge.

On the 17th a female was taken by Mr. R. Brooke and the Rev. F. Fisher about a quarter of a mile away; and I know of three men who went to our locality on the 23rd and captured a good many. They seemed to brave all kinds of weather, for in the strong north-west gale on the 26th a great number came to sugar.

Almost a month later, *viz.* August 17th, in company with Mr. R. Brooke and his two brothers, a female *D. oo* in good condition, very much to our surprise, turned up at sugar. We were working close to the old locality, and it was nice to have its very near relations—*Calymnia trapezina*, *C. affinis*, *C. diffinis*, and *C. pyralina*—all at sugar on that night. Next evening we resugared the old trees. Only two, however, which had seen much better days, turned up.

Thus the insect was out for some six weeks, but how long in any numbers it is difficult to say. What appeared to be its headquarters was only, as far as I know, worked between July 19th and 26th, except for our trial in August. The only really warm spell in our district this summer was between July 6th and 17th, and doubtless nearly all would emerge then. It would, however, be rash to assign less than three weeks for the period during which they were abundant,—this year at all events. It seems that this season, which has been so abnormal in its amount of sunshine (it always appeared to be raining, too, though the total rainfall was below the average), has not exerted as baneful an influence as might have been expected. The dates of emergence have, of course, been very erratic. Perhaps it will be the coming season that will suffer.

Ellacot, Oxton, Birkenhead: November 16th, 1902.

NOTES AND OBSERVATIONS.

A Proposed Entomological Exchange Club for the British Isles.—At the meeting of the City of London Entomological Society, held November 4th last, Mr. F. J. Hanbury, in accordance with a previous intimation, led a discussion as to the advisability of starting an Entomological Exchange Club for the British Isles on similar lines to the Botanical Exchange Club, which was, and had been, in a very satisfactory position for the past five and twenty years. For the general benefit of those who are disposed to consider whether they would support such a scheme, the following *résumé* of the proposed rules and regulations is here set forth:—

1. The object of the Club is to facilitate the exchange of specimens, especially of critical species and varieties. The conditions of membership are that each member shall furnish a parcel of specimens annually, in accordance with the subsequent rules, and pay an annual contribution of five shillings, or of such other sum as may be found necessary to meet the expenses of the Club. He will then be entitled to share in the distribution of specimens made in the early part of the year following that in which his subscription and parcel were sent.

2. Specimens sent for distribution must be carefully set; must be in perfect condition (unless the species is particularly scarce and in great demand). Badly set or imperfect specimens will be returned as received to their owners. Species that might be in danger of extermination will not be received, except in very small numbers, unless bred *ab ovo*.

3. Each specimen must have a clearly written or printed label bearing the name of the species as given in South's list, and must bear locality and date of capture, or date of breeding, and any date obtained that the sender thinks worth while. Specimens sent in each parcel might be arranged in the exact sequence of names adopted in the catalogue before mentioned. Not less than six specimens of each species should be sent, unless very rare or difficult to procure.

4. Any facts connected with a species which the sender thinks important and suitable for a "Report" should be communicated on a separate sheet of paper, *written on one side only* · the notes on each species should be dated and signed by the writer. A Report will be issued at the close of each year containing the various notes sent in by contributors.

5. Each parcel should be accompanied by a list of insects the member wishes to receive from the Club. This list is to be made by drawing a short horizontal line before their names in the catalogue. Species especially wished for should have a ! before the horizontal line. The name of the member and address to which the return parcel is to be sent should be written on the outside of the catalogue, together with any special directions as to the route by which it should be forwarded; the yearly change of distributors necessitates clearness in this particular. When the same copy of the catalogue is used more than once, the species which are no longer wanted, but which were marked, should have a perpendicular line drawn through the horizontal line. Manuscript lists will not be received.

6. Parcels should be sent by parcels post, or by any other means, carriage paid, to one of the distributors for the year *not later than the 31st December*. Those arriving after that date will not be available for the ensuing distribution. Members who send the more valuable parcels will have their return parcels selected before those who send inferior ones.—W. J. Kaye (Sec. City Lond. Ent. Soc.).

Insect Periodicity; Maximum and Minimum Periods.—With reference to the discussion concerning *Plusia moneta* which has been going on in these pages (Lawrance, vol. xxxv. p. 242; Colthrup, *ibid.* p. 320), I should like to point out that it is dangerous to generalize too widely from imperfect data. In some cases no doubt the sudden appearance of a species in large numbers (*V. antiopa*), or the addition of a new species to our fauna (*P. moneta*) may be due to immigration or importation. But it does not follow that all increases towards the maximum are to be explained in a similar way. Allowance must be made for secular causes, such as climatic influence upon the special enemies of the species, and so forth. It is difficult, and in most cases practically impossible, to surmise what local fluctuation in external conditions has been operative in determining the maximum or minimum appearance of a species, but it does not seem to me necessary to invoke the factor of Continental supply whenever we are unable to explain the abundance of a particular insect. These thoughts have been called forth by Mr. Colthrup's remarks (*loc. cit.*) concerning *Porthesia chrysorrhœa.* All that can be said is that we have had a "good year" for this species both here and on the Continent. My reason for offering this contribution to the discussion is that I noted the abundance of this insect this autumn in North Wales, all along the coast from Colwyn Bay to Penmaenmawr, and inland about Capel Curig. There is no direct Continental communication with this coast. —(Prof.) R. Meldola; 6, Brunswick Square, W.C., Dec. 6th, 1902.

"Emperor of Morocco."—This has been used as the name of a butterfly; but I am only acquainted with the two instances quoted in

Murray's 'New English Dictionary'—'Peter Pindar's Poems,' in which the insect *may* be the purple emperor, and Bulwer Lytton's 'Kenelm Chillingly,' where *Papilio machaon* seems to be the butterfly intended. Has any entomologist met with this term as the name of a butterfly in any other book, or orally?—W. F. Kirby.

Vanessa antiopa.—*A propos* of the var. of *V. antiopa* recorded by Mr. Oldaker (*ante*, p. 285), it occurs to me to mention that while in charge of the American Church, Geneva, November, 1898, to April, 1899,—on April 6th in the latter year, while at Etiemlieus and searching for insects at the foot of the Petit Salene—I observed, but unfortunately failed to capture, a particularly large and fresh specimen of *V. antiopa*. Its border was pure white, and was evidently in fresh condition. The white could not have been a case of fading from an originally sulphur hue. The following is an extract from my journal of that date:—"A splendid specimen of *V. antiopa* settled three or four times in front of me, but I failed to secure it, owing to the loose slopes of stone and shale under one's feet. It had a border of pure white. I failed, as far as I could perceive, to discern any blue spots. It was in very fine and fresh condition."—(Rev.) F. A. Walker; Dun Mallard, Cricklewood, N.W., Nov. 1st, 1902.

CAPTURES AND FIELD REPORTS.

Boarmia roboraria in Surrey. — On June 22nd, 1902, whilst collecting at Addington, near Croydon, I took a fine male specimen of *B. roboraria*, at rest on a birch-trunk. I should very much like to know if there are any other records of this species having been taken at Addington or Shirley.—B. Stonell; 25, Studley Road, Clapham.

Notes from Suffolk.—On June 8th last I took a fresh-emerged specimen of *Colias hyale*. While collecting in East Suffolk in June I took a good series of *Cybosia* (*Lithosia*) *mesomella*. I have never before met with it in this county. The dark variety of *Nonagria neurica*, which is, I believe, considered rare, has been as frequent this season as the ordinary type.—Henry Lingwood; Needham Market, Suffolk.

Lycæna astrarche (agestis).—Referring to Mr. Oldaker's remarks on this species (Ent. xxxv. p. 324), I must say that my experience does not quite agree with his. I have seen this butterfly in some numbers, on more than one occasion, near Tring, although sometimes it is scarce. On June 4th, 1900, it was particularly plentiful, and I took fourteen specimens in a very short time, and could have taken many more.—Philip J. Barraud; Bushey Heath, Herts.

Early Emergence of Phigalia pedaria.—I took a fine male *P. pedaria* on Dec. 15th last. The moth was sitting on a tree-trunk in this neighbourhood, and was evidently freshly emerged.—B. H. Crabtree; The Acacias, Levenshulme, Manchester, Dec. 17th, 1902.

Lepidoptera at Wallington.—During the season several more or less local moths were abundant in my garden here. The most noteworthy of these were *Chærocampa porcellus*, *Apamea ophiogramma*, *Triphæna interjecta*, *Tethea subtusa*, and *Plusia moneta*; in fact, in the middle of July *ophiogramma* and *moneta* were in numbers over all the plants, and I might have captured, on an average, thirty specimens of the latter a night, had I been so disposed. Single examples of *Cirrhædia xerampelina* and *Calymnia diffinis* were also taken. Since the time of the capture of *P. moneta* I have been diligently searching for the larvæ of the species on *Delphinium*, which abounds in the garden, but so far my efforts have been unavailing.—LESLIE H. MOSSE-ROBINSON; Wandle Bank, Wallington, Surrey, Oct. 24th, 1902.

SWISS LEPIDOPTERA, 1902.—My father and I arrived at Montreux on May 25th, and took up our abode at the 'Hôtel de Montreux,' close to the station, which was to be our headquarters for the ensuing fortnight. After lunch we went to Veytaux, with our nets, to prospect. The weather was fine and hot, but the mountains were almost obscured by a thick haze. We met with butterflies before we got clear of the houses. Several *Vanessa antiopa* showed themselves, but kept well out of reach. Farther on in the meadows we obtained the following:—*Gonepteryx rhamni*, *Leucophasia sinapis* (common), *Euchloë cardamines*, *Argynnis dia* (one), *Vanessa c-album*, *Cænonympha pamphilus* (common), *Lycæna argiolus* (one male), *L. icarus*, *L. alsus* (common), *Euclidia glyphica* (common), *Venilia maculata*, *Ematurga atomaria*, *Strenia clathrata*, *Scoria dealbata*, *Minoa murinata*, *Emmelesia albulata*, *Crambus pratellus*, and *Erastria deceptoria* (one).

On the 27th we started for Les Avants, *viâ* the Gorge du Chaudron. Les Avants itself, though producing any quantity of narcissi, did not yield any insects worth taking; but in the clearings in the Gorge we met with more success. Most of the species taken at Veytaux occurred here, and in addition:—*Colias hyale*, *Argynnis euphrosyne*, *Melitæa aurinia*, *Pararge hiera*, *Thecla rubi*, *Lycæna acis*, *Nemeobius lucina*, and *Syrichthus malvæ*.

28th.—A very hot day. We went up through the Bois de Chillon to the foot of the snow on the Rochers de Naye, but met with no fresh species except *Tephrosia consonaria* and *Vanessa urticæ*. The latter, which seemed to be uncommon, together with *Euchloë cardamines*, *Lycæna alsus*, and *Nisoniades tages*, were on the wing at the highest point we reached (about 4000 ft.).

29th.—Obtained a specimen of *Carterocephalus paniscus* at Veytaux, and the following at Villeneuve in the afternoon by beating some bushes bordering a very marshy meadow:—*Plusia chrysitis*, *Larentia viridaria*, *Eupisteria obliterata*, *Hypsipetes impluviata*, and *Eubolia plumbaria*.

30th.—Went to Villeneuve by boat, and walked from there to Aigle and back (about six miles each way). Lepidoptera were fairly plentiful near Aigle. I obtained a very good series of *Erebia medusa*, and took two *Papilio podalirius*; the latter rather the worse for wear. We were also able to add the following to our list of captures:—*Argynnis selene*, *Melitæa cinxia*, *M. athalia*, *Pararge megæra*, *P. egeria*, *Hesperia sylvanus* (common), and *Lycæna cyllarus* (one).

31st.—Walked to the Bains de l'Alliaz, passing through Blonay. The latter is the most picturesque village of the neighbourhood, though very odoriferous. Took one *Colias edusa*, female, var. ***helice***, one *Vanessa antiopa*, and another *Pararge hiera*.

June 1st (Sunday).—A very hot day.

2nd.—Visited St. Gingolph and Bouveret. Terrifically hot, but fortunately no flies to worry us. Met with no fresh species.

3rd.—Caught in a storm at Blonay. *Vanessa cardui* was common between that place and Montreux.

4th.—A dull day with clouds low down over the mountains. Went up above Caux to get a few roots of plants, such as gentian, &c. Total entomological bag, one *Erastria deceptoria*.

5th.—Paid another visit to Aigle, going over much the same ground as before. Caught another *Papilio podalirius* in very fair condition, and a good series of *Aporia cratægi* (males), evidently just out. *Epinephele hyperanthus*, *Polyommatus dorilis*, and *Zygæna trifolii* met with for the first time.

Thus ended a very delightful and successful holiday. It will be observed that we attempted no night work. This was partly because we were generally quite ready for bed by the time supper was over, and partly because there was nothing to be got within reasonable distance. We saw no moths around the numerous electric lamps after dark.—PHILIP J. BARRAUD; Bushey Heath, Herts.

LEPIDOPTERA IN NORTH DORSET, 1902.—The earlier part of the season was one of the worst I have ever experienced. East winds and fogs followed by cold nights and much wet in the early summer made even the commonest insects scarce. Sugaring was a total failure (not even *Mamestra brassicæ* being attracted) until September, when it began to be fairly remunerative. I append a list of moths, most of which were taken at light, sugar, or ivy within a quarter of a mile of my house, the remainder by beating and dusking. Besides those specially mentioned, many other commoner species were seen or taken without any particular note being made of time or place. I should mention I was away from home from July 28 to Sept. 10, so that many species were missed. List:—*Chærocampa elpenor*, July 16. *Phragmatobia* (*Spilosoma*) *fuliginosa*, May 6. *Porthesia auriflua*, Sept. 26. *Trichiura cratægi*, Sept. 21–25. *Pœcilocampa populi*, Nov. 1–30. *Malacosoma* (*Bombyx*) *neustria*, Sept. 24. *Odonestis potatoria*, July 16–24. *Cilix glaucata*, June 3. *Dicranura* (*Cerura*) *vinula*, June 8–10. *Bryophila perla*, July 24. *Diloba cæruleocephala* (males), Oct. 23–28. *Leucania pallens*, Sept. 26–27. *Hydræcia micacea*, Sept. 25. *Xylophasia sublustris*, Sept. 13. *Luperina testacea*, Sept. 24–Oct. 10. *Miana arcuosa*, July 24. *Agrotis puta*, Sept. 10–22. *A. suffusa*, Sept. 12–Oct. 11. *A. saucia*, Nov. 15. *A. segetum*, Oct. 28–30. *Noctua plecta*, Sept. 10. *N. c-nigrum*, Sept. 13–30. *N. rubi*, Sept. 12–21. *N. neglecta* Sept. 21. *Amphipyra pyramidea*, Sept. 13–21. *A. tragopogonis*, Sept. 14–21. *Tæniocampa gothica*, April 2. *T. stabilis*, March 16. *Orthosia lota*, Oct. 19–Nov. 15. *O. macilenta*, Oct. 24–Nov. 11. *Anchocelis pistacina*, Sept. 23–Nov. 15. *A. lunosa*, Sept. 19–26. *A. litura*, Sept. 27–Oct. 13. *Cerastis ligula* (*spadicea*), Oct. 28–Nov. 15. *Scopelosoma satellitia*, Oct. 18–Nov. 15. *Xanthia aurago*, Oct. 24. *X. circellaris*, Oct. 10–Nov. 15. *Polia flavicincta*, Sept. 10–Oct. 17. *Miselia oxyacanthæ*, Oct. 25–30. *Phlogophora meticulosa*, Oct. 1–31. *Calocampa exoleta*, Oct. 13–Nov. 5. *Xylina ornithopus*, Oct. 17–Nov. 11. *X. socia*, Oct. 15–29. *Asteroscopus sphinx* (*P. cassinea*), Nov. 23–27. *Gonoptera libatrix*, June 3 and Sept. 10. *Habrostola triplasia*, July 4–10. *Plusia iota*, July 5. *P. gamma*, Nov. 2. *Rumia luteolata* (*cratægata*), May 10–Sept. 20. *Ennomos alniaria* (*tiliaria*), Sept. 21–30. *E. fuscantaria*, Sept. 23. *Himera pennaria*, Oct. 25–Nov. 2. *Biston stataria*, March 6. *Amphidasys betularia*, June 5. *Boarmia rhomboidaria*, July 28. *Zonosoma annulata*, July 10. *Asthena luteata*, July 10–13. *Acidalia remutaria*, June 3. *Halia wavaria*, Sept. 10. *Ligdia adustata*, July 5–13. *Lomaspilis marginata*, June 3. *Hybernia rupicapraria*, March 6. *H. leucophearia*, Feb. 28. *H. defoliaria*, Nov. 30. *Anisopteryx æscularia*, Feb. 28–March 31. *Oporabia dilutata*, Oct. 18. *Larentia viridaria*, June 3. *Melanthia bicolorata*, July 18. *Melanippe sociata*, June 8. *M. montanata*, June 8. *M. galiata*, July 5. *Anticlea rubidata*, July 4–10. *A. badiata*, April 2–May 10. *Coremia designata*, June 8. *Camptogramma bilineata*, July 13–20. *Coremia ferrugata*, June 3. *Phibalapteryx tersata*, July 4–13. *Triphosa dubitata*, Sept. 18. *Eucosmia certata*, May 22–26. *Scotosia rhamnata*, July 10. *Cidaria miata*, Sept. 26–Nov. 5. *C. truncata*, Sept. 26. *C. immanata*, Sept. 18–26. *C. associata*, July 4–17. *Eubolia cervinata*, Sept. 23–Oct. 5. *Tanagra atrata*, July 19. As a whole, the year was a poor one in regard to the total number of species and specimens taken, but, notwithstanding, there were some good captures for the district; amongst the best being *C. elpenor*, *T. cratægi*, *P. populi*, *H. micacea*, *A. puta*, *P. flavicincta*, *E. fuscantaria*, *A. sphinx*, *X. socia*, *C. miata*, *X. aurago*, and *E. certata*. My friend Mr. C. W. Dale informs me that the two last are now recorded for the first time in the county; also that *A. litura*, though commonly taken, is inadvertently omitted from his 'Lepidoptera of Dorsetshire.' There are several curiosities in the matter of dates which may be noticed. They are mostly of late occurrences, and illustrate the abnormal character of the season; amongst others, *G. libatrix*, June 3—this I think, by the way, was the *only* specimen of *any* kind taken at sugar up to then; *M. neustria*, Sept. 24; *P. auriflua*, Sept. 26; *L. pallens*, Sept. 26–27; *P. gamma*, Nov. 2—all unworn specimens taken at light, and, in the case of *P. auriflua* and *L. pallens*, apparently just emerged. I might add that, with regard to our local Rhopalocera, the weather prevented visits being paid to the haunts of *Leucophasia sinapis* and *Nemeobius lucina*, but *Melanargia galatea* and *Melitæa aurinia* were found at home. None of the Coliades were seen, nor did *Sphinx convolvuli* put in an appearance.—James Douglas; Sherborne, Dorset.

Collecting in Yorkshire in 1902.—From Aug. 5th to Sept. 8th this year I was in different parts of Yorkshire, and made expeditions to various localities. The first two weeks were cold and damp, but after that the weather improved, but there was generally a scarcity of insects, no doubt owing to the wretched apology for a summer that we have had. The heather was three weeks later than usual in flowering on the moors. One *Colias edusa* was met with near Bridlington on Sept. 5th, a male in perfect condition. I visited the locality again next day, but could not find another. *Melanargia galatea* was seen in three localities within easy distance of York: in one spot I saw over sixty, and netted a dozen of them. *Argynnis aglaia* was out in several places in small numbers. Others, seen at times, included *Lycæna icarus*, *L. agestis*, *Hesperia linea*, *Vanessa atalanta*, *V. urticæ*, *Cœnonympha pamphilus*, *Epinephele ianira*, *Pieris brassicæ*, *P. napi*, *P. rapæ*, *Zygæna filipendulæ*, &c., but no *Vanessa io* or *Epinephele hyperanthus*, which are usually to be found in some of the places visited. *Plusia gamma* was just coming out on the moors with *Charæas graminis*. The latter was abundant on Dalby Warren on Sept. 1st, bustling about the clumps of bracken, in spite of the rain that was falling. A few worn *Anarta myrtilli* and one fresh *Hypsipetes elutata* were kicked up out of the heather. Larvæ of *A. myrtilli*, *Macrothylacia rubi*, and *M. quercus* var. *callunæ* were frequent, with a few *Saturnia pavonia* and some *Vanessa atalanta* just pupating. The only dragonfly identified was *Sympetrum scoticum*, which was abundant near the head-waters of the Derwent. *Cicindela campestris* was, as usual, common, but I was unable to find any *Carabus nitens* where it was plentiful five years ago. Long walks or cycle-rides over the moors near Whitby, Pickering, and Scarborough, and over the wolds between Malton and Driffield, furnished several species of galls. *Salix repens* on Dalby Warren seemed to bear more than usual of the bright red ones, but those of *Euura pentandræ* on *Salix pentandra* were scarce, there being only a few fresh ones to be found. One I had not seen before was a crimson cup-shaped gall, arranged in rows along the midrib of the leaves of *Spiræa filipendula*. The different cells were connected by a solid wall of tissue, and each one examined was occupied by a fully-formed pupa of a small species of Hymenoptera, though whether this was the maker or only a parasite I cannot say. If the latter, then they had carefully removed all traces of their hosts. Another one was on *Rubus idæus*, made by larvæ of a *Cecidomyia*. Several species of oak-galls were more numerous than usual in the woods bordering the moors.—Harold J. Burkill; 79, Cornhill, E.C.

Collecting in the New Forest.—After many fruitless attempts to obtain rooms at Brockenhurst, my father and I eventually found ourselves, on Aug. 1st, at Bank, where we stayed for ten days. I suppose that nobody will have much to say in favour of the season 1902, for it has been quite one of the worst I can remember. We had no really hot weather during the ten days, and rain was frequent. On the whole, I think that collecting was as good as could be expected, larvæ, at any rate, being plentiful, Among the latter were *Smerinthus ocellatus* (a few from crab-apple), *Macroglossa fuciformis* (two, honeysuckle), *M. bombyliformis* (scabious, one), *Euchelia jacobææ* (abundant), *Lithosia aureola* (?), *Nola cristulalis*, *Halias prasinana*, *Orgyia antiqua*, *Dasychira pudibunda* (common, but small), *Psilura monacha* (one full-grown, from beech). *Saturnia carpini* (two), *Macrothylacia rubi*, *Drepana falcataria* (two), *D. lacertinaria* (one), *Phalera bucephala*, *Clostera reclusa* (on dwarf sallow), *Stauropus fagi* (one), *Ptilodontis palpina* (two), *Lophopteryx camelina* (some full-grown, others quite small), *Notodonta dromedarius* (one), *N. trepida* (one, full-grown), *N. chaonia*, *N. dodonea*, *Diphthera orion* (eight very small ones fell from one beat, and other larger ones were taken), *Trachea piniperda* (one or two), *Anarta myrtilli*, *Tæniocampa stabilis*, *Ennomos erosaria*, *E. tiliaria*, *Eurymene dolabraria*, *Amphidasys betularia*, *A. prodromaria*, *Boarmia consortaria*, *Tephrosia extersaria* (*luridata*), *Pseudoterpna cytisaria* (on genista), *Ephyra punctaria* and probably *E. porata*, *E. pendularia*, *Macaria liturata*, *Bapta taminata*, *B. temerata*, *Eupisteria heparata*, *Ematurga atomaria*, *Cidaria psittacata* (*siderata*). The examples since bred from the last-named are a grand deep colour. A notable absentee from my list is *Acronycta alni*, of which species the larvæ appear to have been commoner than usual this year, several other collectors obtaining it.

Turning to the butterflies, *Pieris napi* was abundant, but very few *P. rapæ* were seen. *Gonepteryx rhamni*, abundant. *Argynnis* (*Dryas*) *paphia*, abundant as usual. A number of var. *valesina* were seen, but were mostly in poor condition. *Epinephele ianira*, *E. tithonus*, and *E. hyperanthus*, all common. *Cœnonympha pamphilus*, abundant. *Satyrus semele* was common on the heaths. *Vanessa urticæ*, common. *V. polychloros* was just coming on the wing and was in grand condition. Several examples were seen on the old treacle patches, and it also seemed fond of sunning itself on the tree-trunks and palings late in the afternoon. *Limenitis sibylla*, plentiful and in poor condition. *Thecla quercus*, abundant and fine. *Lycæna ægon*, abundant and fine. *Hesperia sylvanus*, *H. thaumas*, both fairly common. A short dumpy green pupa, taken hanging from a log of wood, proved to be *Pararge egeria*.

Day-work and dusking, the latter very bad, produced about seventy species of moths, among which were the following:— *Sarothripus undulanus* (half a dozen, in first-rate condition, beaten from oak and beech), *Gnophria quadra* (a few, very worn), *Lithosia helveola* (two males), *L. griseola* and var. *stramineola* (one of each), *Calligenia miniata* (one in a spider's web), *N. strigula*, *Limacodes testudo* (one), *Lasiocampa quercus* (males abundant flying over the heather; one female, at rest on heather, deposited a number of fertile ova), *Psilura monacha*, *Drepana cultraria*, *Noctua stigmatica*, *Heliothis dipsaceus* (seen, but missed after a long chase), *Erastria fuscula*, *Aventia flexula*, *Ennomos erosaria*, *Cleora glabraria* (two fine examples), *C. lichenaria* (one, very worn), *Pseudoterpna cytisaria*, *Gnophos obscurata* (locally abundant), *Selidosema plumaria* (very local, a number of males in first-rate condition), *Ephyra trilinearia*, *Acidalia trigeminata*, *Eupisteria heparata*, *Macaria liturata*, *Pachycnemia hippocastanaria* (worn), *Emmelesia alchemillata* (one, at dusk), *Melanthia albicillata* (very fine), and *Botys lancealis*.

Treacle was a decided failure, the following being the only species noticed: —*Nola strigula* (two), *Gnophria quadra* (one), *Xylophasia polyodon*, *X. hepatica* (worn), *Thyatira batis*, *Gonophora derasa*, *Amphipyra pyramidea*, *Cosmia trapezina*, *Catocala sponsa* and *C. promissa* (both just coming out and not very abundant), *Gonoptera libatrix* (one), *Hypenodes albistrigalis* (?).

A number of species came indoors to light. We found it a good plan to put the acetylene lamp in the window. The following were attracted:—*Lithosia lurideola* (one), *Porthesia similis*, *Lophopteryx camelina* (one), *Xylophasia polyodon*, *Apamea oculea*, *Caradrina* (? *blanda*), *Triphæna interjecta* (one), *T. ianthina*, *Bryophila perla*, *Selenia illunaria* (males), *Epione apiciaria* (one), *Boarmia rhomboidaria*, *Iodis vernaria* (one), *Crocallis elinguaria*, *Pseudoterpna cytisaria*, *Cabera exanthemata*, *Acidalia aversata*, *Melanthia ocellata*, *Lomaspilis marginata*, *Abraxas grossulariata*, *Botys lancealis*, *B. ruralis*, *Scopula prunalis*, *Nomophila noctuella*, *Aphomia sociella*, and numerous Micros.

The Odonata noticed were:— *Sympetrum striolatum*, *S. scoticum* (one), *Pyrrhosoma nymphula*, *P. tenellum*, *Ischnura elegans*, *Enallagma cyathigerum*, *Platycnemia pennipes*, *Orthetrum cærulescens* (abundant), *Calopteryx virgo*, *Æschna* (*cyanea* ?) and *Cordulegaster annulatus*.

A number of Coleoptera were taken, but I have only the names of a few. A dead rabbit in a peculiarly decomposed condition was discovered in Queen's Bower, and yielded *Silpha rugosus*, *S. sinuatus*, *S. littoralis*, *Necrophorus* (? sp.), *Saprinus nitidulus* (abundant), various Histers (not identified), *Philolonthus æneus*, and *Creophilus maxillosus*. A specimen of the large *Prionius coriarius* was taken at treacle, but was unfortunately minus one of the elytra. *Carabus* (? *catenalatus*) and females of *Lucanus cervus* also came to treacle. The following were also taken:—*Cicendela campestris* (one), *Silpha atratus* (one), *Athous hæmorrhoidalis*, *Agriotes sobrinus*, *Aphodius rufipes*, *Anomala frischi* var., *Strangalia armata*, *Leptura livida*, and many others yet to be determined.—F. M. B. Carr; care of Rev. A. G. Robertson, M.A., The Close, Salisbury.

Note on the Season at Chichester.—Without doubt the present year will be remembered in most localities as the worst season for Lepidoptera on record, and so far as my own experience goes I have never known such a bad one for collecting. Under such conditions, perhaps, the record of almost any insects is useful and interesting, and with this view this note is written. Geometers were especially scarce, *Anticlea rubidata*, which appeared first on July 16th, being about one of the best species seen. On July 17th a *Geometra papilionaria* was taken, at rest on a window-sill in the street. During May three or four larvæ of *Gastropacha quercifolia* were found at Apuldram by Mrs. Fogden. *Zeuzera æsculi* was taken during August. On Oct. 1st a male *Eugonia autumnaria* (*alniaria*) was secured, seated on a house in the daytime. Sugaring was quite useless, the only moth worth noting being *Mania maura*.—Joseph Anderson.

Suburban Notes, 1902.—Owing to various reasons we were unable to do much collecting at home during the past season, but, nevertheless, although Lee is rapidly becoming a part of London, one or two unusual species put in an appearance. A few examples of *Biston hirtaria*, which seems to be scarce with us, were noticed in April. A specimen of *Tæniocampa instabilis* (*incerta*) was seen as late as May 24th. The first brood of *Cyaniris argiolus* was not so common as last year, and apparently about a fortnight later, *viz.* end of May and beginning of June. A larva of *Lasiocampa quercus* was taken in the garden at the end of May. A male *Anthocharis cardamines* was seen on June 1st, in the Eltham Road. A few *Smerinthus tiliæ* turned up in June and July, and the larva of the same species in August. July produced a few more notable species, the most remarkable being a fine specimen of *Earias chlorana*, taken from a paling over which hangs a willow-tree. This species, I believe, was common here many years ago. Single examples of *Apamea ophiogramma*, *Hepialus humuli* (formerly common enough), and *Zeuzera æsculi* were taken; also *Phibalapteryx tersata*. I first noticed *Mania maura*, which is common with us, on July 15th, and it continued in great abundance into September. In August *Pelurga comitata*, *Halia vauaria*, and a few *Hepialus sylvanus* appeared; also the second brood of *Cyaniris argiolus*, about the middle of the month. Two boy-friends, who have just begun collecting, obtained three larvæ of *Cerura bifida* from Brockley, which is about four miles from London Bridge. In September several *Vanessa io* were noticed at Lee and in Greenwich Park. Among the visitors to treacle in this month were *Agrotis suffusa*, *Hydræcia micacea*, and *Catocala nupta*.—F. M. B. Carr; The Choristers' School, The Close, Salisbury.

Notes from Romford, Essex.—I have simply done nothing here this year, except at light, which was fairly productive. That was the only way I knew whether anything was flying, as the species which usually come to sugar put in an appearance at light instead. As for sugar, it was hopeless. Up to the beginning of August not a moth of any kind. For the first week of August a few *Noctua xanthographa*. After that I cannot say what occurred, as I went for a holiday and did not entomologize much. Since I returned home it is as bad as ever. Even *Anchocelis pistacina* is only coming to light. Can anyone explain this failure of sugar in a particular district? It is so all round here, and it cannot be the quality of the sugar, as I used the same mixture a few times at Weymouth, and plenty of moths came to it.—(Rev.) W. Claxton; Navestock Vicarage, Romford, Oct. 6th, 1902.

Notes from the Chester District. — The chief features of the season 1902 have been a low temperature and a lack, on the whole, of insects. The only Lepidopteron which could be marked, in my experience, as plentiful, was *Brephos parthenias*—in Delamere Forest—in March, but more especially in the early part of April. Twenty specimens were taken, by day and night, on April 4th. They were found, after dark, by the aid of a lamp, resting on birch, and one on sallow bloom. May was chiefly devoted to a search for *Anticlea derivata*, in the hope of getting eggs. Night after night we plunged through the mud-holes of King's Wood Lane—cold and often rainy the nights were, and very different from those of last year—but the total sum was a couple of examples, male and female, and, as the latter had already deposited her eggs, the result was failure.

There was fine warm weather in June and July, and Delamere Forest saw us frequently. *Cœnonympha davus* was scarce, through over-collecting, in comparison with last year. None of the specimens I captured showed the large spots referred to last season (Entom. xxxiv. p. 257), but some are very liberally and clearly spotted. Perhaps the best is a female, showing a row of pointed spots on the upper surface of the hind wings near the margins. In one part of the forest district there is a nice and boldly-marked form of *Ematurga atomaria*. My best capture in this line was a female, the prominent characters of which are an unusually broad black band near and parallel with the outer margins of both fore and hind wings, and a dusting, chiefly basal, of yellowish scales. Other Delamere captures worth noting are a female *Melanthia albicillata*, two *Acronycta menyanthidis*, and three good examples of the sooty form of *Macaria liturata* var. *nigrofulvata*, all in July.

Electric lamps, owing to the unsatisfactory weather, were very much of a failure. About a dozen *Dicranura bifida* were captured, but all were males; a couple of *D. furcula*—males again, and the same sex was represented in all the black *Amphidasys betularia* I took. A few *Notodonta dictæa* turned up—males again; in fact, it is puzzling why male insects, chiefly, come to the lights. A fine dark *Cerigo matura* (*cytherea*), July 23rd; a *Leucoma salicis*, Aug. 1st; *Habrostola triplasia*, *Triphæna ianthina*, *Drepana binaria* (*hamula*), *Acidalia incanaria*, and *Epione apiciaria*—all in August; *Nonagria typhæ* and *Eupithecia centaureata* in September, are the best things I gather from my notebook. One example each of *E. apiciaria* and *E. centaureata* were females, and from these I obtained eggs. Those of *E. centaureata* were white, and hatched Sept. 19th. The tiny larvæ are now feeding on ragwort flowers. The eggs of *E. apiciaria* are reddish, with whitish blotches, and they will lie over the winter, I suppose, before hatching. Now and then a big *Smerinthus ocellatus*, or *S. populi*, invariably males, would flop down at the foot of a lamp in June. But the temperature dropped so about the middle of July that people took to overcoats, and the lamps became hardly worth working.

By far the most interesting work of the season was a closer acquaintance with the district larvæ. *Agrotis ashworthii* began emerging from the chrysalis, July 1st. All the imagines were of the usual stereotyped shade and pattern. The first *A. lucernea* appeared, July 18th, and in the series bred I got a fine dark specimen, the pale wing-fringes showing up conspicuously. July 12th one of our party found a lot of eggs of *Macrothylacia rubi* in Delamere Forest. They were laid in clusters on the pendent wire-like blades of cotton-grass. How a big, heavy, moth-like *M. rubi* managed to do this is rather puzzling, but I suppose her weight pulled down the blades, which afterwards rose again with their burdens. The eggs were entrusted to me. Many of them were infertile, and the rest hatched July 18th. Since that date the larvæ have been forced, and they were all full-grown by Sept. 14th. They are still eating a little, Oct. 16th. Of course, my object is to get them to skip the hybernating period and pupate, but whether I succeed or not seems doubtful. All along I have fed the larvæ on sallow, which they evidently like.

The great object of the summer was to see—remembering that the perfect insects are not rare at the electric lamps—how and in what numbers the larvæ of *Dicranura bifida* and *D. furcula* could be found by close searching. *D. vinula* we saw in all its stages—the russet-coloured egg, the young caterpillars like black strokes on the sallow or poplar leaves, and the caterpillars full-grown or nearly so. From a single poplar-bush—say a couple of yards wide and forming part of a hedge—I picked, July 26th, twenty-one for some young friends. Possibly they formed two separate broods, for about half were in the final, while the remainder were in the preceding stage. Then there was *Smerinthus ocellatus;* in one afternoon in the middle of August we counted seventy larvæ of this species. There were old acquaintances: *S. populi* (plenty of them), *Orgyia antiqua*, *Odonestis potatoria* (eggs), *Porthesia similis* (*auriflua*) (larvæ, pupæ, imagines and eggs all at the same time), *Acronycta alni* off birch (only two, but possibly male and female), *Notodonta dictæa* (a few), *Gonoptera libatrix*, *Nonagria typhæ*, and a caterpillar I have never before met with in the district, although the moth is common enough at the electric lamps—*A. megacephala*. Both *D. bifida* and *D. furcula* were scarce July to September, especially the first species. Three caterpillars of *bifida* and seven of *furcula* were the totals for each. The *bifida* were all off poplar, while *furcula* favoured both poplar and sallow. There was a good deal of difference between the caterpillars of each. Both have a pattern along the back which looks like a purplish dorsal hood and mantle bordered with yellow. In *D. bifida* the hood is separated from the mantle; in *D. furcula* the two are connected, but amost separated at segment 4. Then the mantle in *furcula* is always ornamented with bright russet, the same tint as on the upper wings of the moth *G. libatrix*.

In September and October larvæ of *M. liturata*, *Bupalus piniaria*, and *Ellopia prosapiaria* (*fasciaria*) were beaten from Scotch firs in Delamere Forest. *Liturata* were not very common. One day, Oct. 4th, I got three, whilst a companion was lucky enough to get nine. *Fasciaria* was a common caterpillar; it looks, roughly speaking, very like *A. betularia*. Some of the specimens were marbled with dark green, others with red. Autumn imagines of *Thera variata* were on the wing, and a good many of their little green pupæ were beaten out of the Scotch firs. From these (Oct. 17th) I am getting some very pretty moths. The only other Delamere Forest larvæ worth referring to were those of *Aplecta nebulosa*, captured on April nights, from which were reared very representative series of moths, culminating in the darkest forms.

Among dragonflies I was agreeably surprised, in July, to get *Platetrum depressum* in Delamere Forest. The most important observation was a second and very general appearance of *Ischnura elegans* in the beginning of August.—J. Arkle; Chester, Oct. 17th, 1902.

The Season of 1902.—With regard to rearing Lepidoptera I have noticed two things during the past season: first, that larvæ have, as a rule, taken longer to feed up than usual; and, secondly, that a greater percentage have died than is generally the case. To take the insects in something like order, my first imago, from a brood of *Sphinx ligustri*, appeared on June 7th, *Hyloicus* (*S.*) *pinastri* (bred from foreign ova) having emerged on June 2nd. Only one out of seven pupæ of *Chærocampa elpenor* came through, and that was not a very good specimen. It emerged on June 1st, which is three weeks earlier than my entry for this species in 1901. I found two larvæ early in September, and the first of these went down to pupate on September 25th. *Smerinthus ocellatus* imagines began to appear on June 18th, which is over a month later than the first entry for last year. *Dilina* (*S.*) *tiliæ* emerged on April 26th and following days, whereas in 1901 the first did not come out till May 29th. That is all I have done with the "hawks" this year. The larvæ of *Zygæna filipendulæ* were fairly common at the beginning of July, and the first imago appeared in my breeding-cage on July 26th. Some ova of *Œnestis* (*G.*) *quadra* were sent me in July, and I did not expect the larvæ to emerge till next spring. They appeared, however, on August 1st, and though I tried them with lichen from various trees, none of them ate anything at all, as far as I could see, and all were dead within a week. The imagines of *Hipocrita* (*E.*) *jacobææ* were plentiful here during the latter end of May and the beginning of June, and I never saw so many larvæ before as there were during July. They began to go down on July 22nd. Wherever ragwort occurred there seemed to be a brood of them, and a friend of mine, who is a botanist as well as an entomologist, observed a batch of larvæ feeding on the greater knapweed. A fine larva of *Arctia caia*, which I found crawling on an asphalte path, pupated on June 20th, and the imago appeared on July 12th. I took several females, and got a great number of ova, which I put down in a bed of nettles, and I shall examine the larvæ next spring, if all goes well. On June 20th the first imago of *A. villica* came out, and on the 23rd a brood of larvæ of *Euproctis* (*P.*) *chrysorrhœa* pupated. The resultant imagines came out from July 15th till about the first week in August, and I am very glad to have finished with this obnoxious insect, as I once got very badly stung when changing the food of the larvæ. Imagines of *Dasychira pudibunda* came through on April 23rd, from pupæ found in the autumn of 1901. *Trichiura cratægi* is one of the species I have bred right through this year. The young larvæ appeared on April 18th, but by the time the last change of skin had taken place, there were only half a dozen left out of about twenty. Of these only two attained the perfect state, a male emerging on Aug. 30th, and a female on Sept. 7th. On June 9th I discovered a batch of larvæ of *Malacosoma* (*B.*) *neustria* sunning themselves on a blackthorn bush at Bembridge, Isle of Wight, and as I had bred a series last year on apple, I thought I would take these to see if they differed at all. The result fully justified the trouble, for the males of this year's brood are much darker, and the females much smaller, than last year's; in fact, if I had not bred both from the larva, I should not have taken them for the same species. The rest of the imagines from my batch of *Lasiocampa* (*B.*) *quercus* larvæ, bred last year, came through towards the end of June this year; so that the full history of these is: four larvæ spun up on May 16th, 1901, and the imagines emerged from July 12th to 19th; the rest went on feeding till August, and the moths emerged from June 28th to July 22nd, 1902. Are these latter to be called var. *callunæ?* They are absolutely identical with the others, and all are, as I have said, from the same batch of larvæ. A fine larva of *Gastropacha* (*L.*) *quercifolia*, which pupated on June 20th, produced an imago on July 9th. On April 21st an example of each sex of *Saturnia pavonia* emerged; they paired immediately, and by the next morning the female had deposited 252 ova, most of which proved fertile. The resultant larvæ appeared on May 31st, and pupated on July 27th. Several pupæ of last year's brood are standing over till next year, as are also a whole brood of *Endromis versicolor*. I reared *Drepana lacertinaria* and *D. falcataria* from ova. The dates for these are: *Lacertinaria*, larvæ, June 5th; pupæ, July 6th; imagines, July 16th. These are much larger and lighter in colour than some that were sent me recently from Bexley. *Falcataria*, larvæ, June 18th; pupæ, July 7th; imagines, July 17th. These, curiously enough, are smaller and darker than some sent me from Bexley. A very healthy brood of *Dicranura vinula* devoured a great deal of willow from June 25th till July 27th, when the first one began to spin up. The imagines from last year's brood of *Pterostoma palpina* appeared at intervals between May 14th and 29th, and *Lophopteryx camelina* between May 28th and June 11th. *Notodonta dromedarius* is one of my total failures this year, for the young larvæ which emerged from ova on July 6th entirely refused to eat. A very good series of *N. ziczac*, varying nicely in colour, came out on April 16th and 20th, June 8th, 10th, 21st, and 24th. I was very successful with the three "chocolate tips": *Pygæra curtula*, larvæ, June 19th; pupæ, July 15th; imagines, July 28th. *P. anachoreta*, larvæ, May 1st; pupæ, June 19th; imagines, June 30th. *P. pigra*, larvæ, June 25th; pupæ, July 26th; imagines, Aug. 14th. Among the Noctuæ, some fine imagines of *Acronycta aceris* emerged on June 21st; some larvæ of *Diloba cæruleocephala* spun up on July 11th, and the resultant imagines began to appear on Oct. 29th, and two pupæ of *Agrotis puta* yielded perfect insects on May 14th and 15th. A batch of ova of *Polia chi* hatched on March 23rd, and fed up very well on whitethorn till May 29th, when the first went down. A fine series of imagines began to appear on July 16th, with a good range of shades, but none was dark enough to be referred to the variety *olivacea*. Some larvæ of *Miselia oxyacanthæ* fed and throve very well till May 23rd, when they went down, but only two succeeded in pupating, and these died before the end of July. Only two out of about three dozen larvæ of *Agriopis aprilina* reached the final stage, most of them dying off when quite small; two fine imagines, however, appeared, one on Sept. 28th, and the other on Oct. 2nd. A brood of *Amphipyra pyramidea* died off altogether, after feeding up well till June 8th.

Of the Geometræ, about fifteen or sixteen larvæ of *Epione apiciaria* refused to feed at all, and about two dozen *Ennomos erosaria* fed up very well for about a fortnight, after hatching from the eggs on May 19th and following days, but died off before pupation. Out of sixteen ova of *Selenia illunaria*, only two reached the imago stage, and out of about fifty ova of *E. fuscantaria* only ten imagines appeared, and these were very small. A fine series of *S. illustraria* from last year's larvæ appeared on March 28th and following days, and I was very successful with *E. autumnaria*, *E. tiliaria*, and *E. angularia*. The former fed up well on lime from April 26th till July 15th, and the resultant imagines began to appear on Aug. 7th. Twenty-six came through, out of thirty-two ova, and all of them are fine insects. The dates for *E. tiliaria* are: larvæ, May 9th; pupæ, July 3rd; imagines, July 15th; but though a good many came through, several of them were rather small, and there was a marked preponderance of males over females. Ten *E. angularia* emerged on June 30th and following days, having pupated on June 10th from larvæ which hatched on April 14th. I don't think I lost a single one of these. A fine lot of larvæ of *Himera pennaria* (twenty-five in number) fed up rapidly and well, and went down on May 3rd; but not a single one pupated, for, much to my disappointment, when I examined them I found that they had all shrivelled up and died. *Nyssia zonaria* was another complete failure. The majority of the larvæ entirely disappeared, leaving three at first and finally one, which also died after becoming almost full grown. This led me to suspect that they were cannibals. Out of about fifty larvæ of *Amphidasys strataria*, which emerged on May 26th, only eight passed through to the pupa, the first pupa having appeared on July 17th, and I strongly suspect these of cannibalistic propensities also. Some fine black imagines of *A. betularia* var. *doubledayaria* emerged on April 29th and following days. The first few were the blackest, and they gradually got lighter and lighter, though none were of the normal spotted type. A female of *Melanthia ocellata*, obtained by beating on Ranmore, deposited a number of ova on the way home on July 3rd, and the little larvæ appeared on July 5th; but I did not take much trouble about them, and they all died in a few days. I think that, considering the season, my moth-rearing during the year may be described as having been fairly successful.

Altogether, seventy-five species of Heterocera were taken by me this year, including *Lithosia sororcula*, *Pœcilocampa populi*, *Drepana cultraria*, *Plusia chrysitis*, *Acontia luctuosa*, *Phytometra viridaria*, *Euclidia mi*, *E. glyphica*, *Acidalia ornata*, *A. marginepunctata*, *Bapta temerata*, *Aspilates ochrearia*, *Eupithecia oblongata*, *E. assimilata*, *E. pumilata*, *Lobophora viretata*, *Melanippe rivata*, and *Cidaria dotata*. These have been taken either while collecting during the day, or by beating, or by searching the lamp-posts at night; but I am afraid I have been lazy with regard to the collecting of the night-flying moths, having done no sugaring, sallow, or ivy-blossom searching.—F. A. Oldaker; Parsonage House, Dorking, Nov. 10th, 1902.

SOCIETIES.

Entomological Society of London.—*November* 19*th*, 1902.—The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair.—Mr. E. M. Cheeseman, of 68, Railway Street, Durban, Natal, was elected a Fellow of the Society.—Dr. Sharp, F.R.S., exhibited the egg-cases made by a beetle of the genus *Aspidomorpha* (*A. puncticosta*), and stated that they had been sent to him by Mr. F. Muir, of Durban, Natal, where the beetle and the egg-cases are common. He said that Mr. Muir had observed the manner in which the case is formed, and hoped shortly to present a paper to the Society describing this, and the anatomical structures involved.—Dr. Norman H. Joy exhibited a well-marked aberration of a female *Lycæna icarus* striped black on the under side in the place of the usual ocellations; an androgynous specimen of the same species; an aberration of a male *Lycæna bellargus*, similarly striped on the under side; a specimen of *Lycæna argiades* taken in 1885 near Bournemouth; and specimens of *Apatura iris* from the neighbourhood of Reading, captured in 1901. Describing the habits of the latter species, he said that with Mr. Lee he took altogether fourteen specimens, all males, eleven of them from the three top branches on the north side of a beech tree, which appeared to be the throne of the ruling "Emperor" of the wood. Whenever another *iris* came by, the one on the "throne" attacked it, and after a fight in which one would eventually pursue the other out of sight, the conqueror would return to the perch. If this was captured, the next *iris* coming along would take possession of the throne, and so on.—Mr. Claude Morley exhibited the specimen of *Diastictus vulneratus*, Sturm., first recorded in Great Britain in the current number of the 'Entomologists' Monthly Magazine,' and a rare blue form of *Phratora vitellinæ*, taken on low herbs, from Tuddenham Fen, Suffolk.—Mr. G. C. Champion exhibited specimens of *Nanophyes durieui*, Lucas, a beetle from Central Spain, with drawings of the larva, pupa, and perfect insect.—Professor E. B. Poulton, F.R.S., stated that Mr. A. H. Church, M.A., of Jesus College, Oxford, had observed the larvæ of a species of *Cucullia* (probably *C. verbasci*) feeding upon *Buddleia globosa*, which was growing against a wall in the Oxford Botanical Gardens. Mr. Church had sent shoots of the same plant to a friend at Warwick, and these, when grown in a similar position in his garden, were all attacked by the same species during the past summer (1902). It is possible that the eggs are laid upon the *Buddleia* because of the very rough general resemblance in certain respects between its leaves and those of *Verbascum*, in the same manner, as the speaker suggested in 1887, that the common food-plants of *Smerinthus ocellata*, viz. apple and sallow, may be explained by the parent moth having mistaken the one for the other (Trans. Ent. Soc. Lond. 1887, p. 314). In Section 11 of the memoir cited, it is shown that many young larvæ, on emergence from the egg, are able to feed upon strange species of plants, which later they would refuse if they had become specialized to one of the recognized food-plants.—Mr. H. Goss said that larvæ of *Chærocampa elpenor* found on an American balsam near Weybridge had afterwards refused their usual food, *Epilobium hirsutum*; and Mr. R. McLachlan, F.R.S., mentioned the case of *Mamestra persicariæ*, a pest in his garden at Lewisham, which as a rule attacked first and most *Anemone japonica*. He had this year offered them fern and elder (which is reputed a favourite food), but the larvæ found upon the anemone refused to touch either of the plants.—Professor Poulton expressed his opinion that unusual food-plants must commonly be begun from the egg, and as an example quoted the case of *Phalera bucephala*, which, found half-grown on hazel, refused to touch elm and *Salix triandra*, there being with this as with other species evidently some sort of gastric association between the larva and its food-plant. He also read a communication from Mr. G. F. Leigh, of Durban, Natal, relating to insect enemies there. The writer referred to the ordinary and very common grey South African rat, as one of the most dreadful pests to breeders of butterflies and moths. They seemed to be fond of almost any pupæ, and thick wooden boxes containing them were eaten right through, and the contents devoured. They especially affected *Chærocampa eson* and *C. nerii*. Even more remarkable was the way in which they captured moths on the wing whilst feeding. A rat would leap from the roof right on to the plant, and more often than not the moth selected for attack was captured, usually followed by a fight amongst the rats over the prize. The moths caught in this way were *Sphinx convolvuli*, *Nephele variegata*, *Chærocampa eson*, and *C. celerio*. The first-named is the most successful in escaping, owing to the long proboscis which compels it to hover at some distance from the blossom. *N. variegata* is probably the swiftest flier, but is more conspicuous owing to its dark colour. Bats were also very destructive of South-African insect-life.

December 3rd.—The President in the chair.—Mr. Philip J. Barraud, Bushey Heath, Herts; Mr. William E. Butler, Hayling House, Oxford Road, Reading; and Dr. Malcolm Cameron, R.N., H.M.S. 'Harrier,' Mediterranean Station, were elected Fellows of the Society.—Mr. H. W. Andrews exhibited a male specimen of *Therioplectes luridus*, from Chattenden, July, 1902. Females of this species have been taken at Nethy Bridge, N.B., in 1900, by Colonel Yerbury, but there appears to be no record of the capture of the male. He also exhibited a male *Platychirus sticticus*, and a female *Microdon devius* from Eltham and Shoreham (Kent), respectively, and three small dark examples of *Syrphus balteatus*, taken near Brockenhurst, where the form was not uncommon, in October, 1902.—Mr. M. Burr exhibited two species of *Phyllium* from Ceylon, sent by Mr. Green, *P. bioculatum*, Gray (=*erurifolium*, Hann., and *scythe*, Gray), and *P. athanysus*, Westw.—Mr. A. J. Chitty exhibited a box of insects, taken between Sept. 22nd and Oct. 7th last, from a decayed fence or hedge made of different kinds of wood, with the bark left on. The uprights of the hedge were chiefly of birch. The exhibit comprised about a hundred species, of which seventy-nine or eighty were Coleoptera. Four species of beetles, *viz.* two species of *Pogonocherus*, the scarce *Microcephalus albinus*, and the extremely rare *Tropideres niveirostris*, mimicked the surroundings of lichen-covered bark, and one; *Acalles tribatus*, resembled buds. Of the rest, there were five species of *Dromius*; *Anisoxya fuscula*, Ill., *Orchesia minor*, *Clinocara tetramera*, Thoms., and *Tetratoma ancora*. A discussion followed, in which the President, Professor E. B. Poulton, and others took part.—Mr. R. Adkin exhibited a hybrid *Selenia bilunaria* × *S. tetralunaria*, together with spring and summer examples of both species for comparison. The hybrid presented some of the markings of each of its parents, the crescentic blotch at the apex of the fore wings, and the band on the hind wings, closely following *tetralunaria*, but no trace of the dark spot usually so distinct on each of the wings of that species, especially in the summer emergence, was visible, while the "second line" of the fore wings closely followed *bilunaria*. In colour it more nearly resembled that of the summer brood of *tetralunaria*.—Mr. G. C. Champion read a paper on *Nanophyes durieui*.—At a Special General Meeting, held the same evening, the proposed amendments to the bye-laws were considered and adopted by resolution. —H. Rowland Brown. *Hon. Sec.*

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked* * *are bred;* † *are high flat-set.*

Duplicates.—Cinxia, Anachoreta, Autumnaria, Fuscantaria, Illustraria (spring and summer forms), Rubidata, Radiata and other extreme forms of Lubricipeda, Ambigua, Neglecta, Chi, Saucia, Puta, Sponsa, Promissa, Betulella, and many others. *Desiderata.*—Sericealis, Grisealis, Costæstrigalis, Turfosalis, Lineolalis, Cratægalis, Resinalis, Alpina, Dentalis, Punicealis, Hyalinalis, Terrealis, Stachydalis, Cinctalis, Pulveralis, Margaritalis, Straminalis, Lancealis, Stagnalis, Stratiotalis, Forficellus, Mucronellus, Gigantellus, Paludellus, Alpinellus, Falsellus, Hamellus, Myellus, Warringtonellus, Selasellus, Fascelinellus, Salinellus, Farrella, Acidalia, Straminata, and others.—*George T. Porritt; Mayfield, Edgerton, Huddersfield.*

Duplicates.—A few Ripæ, Littoralis, Albicolon (fair), Lanestris, Thaumas, Comma, &c. *Desiderata.*—Athalia, C-Album, Iris, Pruni, Artaxerxes, Palæmon. *A. T. Goodson;* 18, *Park Road, Tring, Herts.*

Duplicates.—Machaon,* Cinxia,* Cardui, C-Album, Polychloros,* Galatea, W-Album,* Corydon, Fuciformis, Miniata, Monacha, Hera, Minos, Anachoreta,* Falcataria,* Suffusa, Suspecta, Lota, Pistacina, Litura, Spadicea, Croceago,* Circellaris, Xerampelina, Fimbria, Australis, Festucæ (4), Fasciana, Syringaria,* Autumnaria,* Erosaria,* Tiliaria,* Porata,* Annulata,* Badiata, Vitalbata,* Polycommata, Cervinata.* *Desiderata.*—Very numerous, especially ova and pupæ.—*A. Simmons; Rutland House, Loughborough Road, West Bridgford, Nottingham.*

Duplicates.—Atalanta, Io, Urticæ, Filipendulæ, B. Quercus, Fuliginosa; all bred, and in first-class condition. *Desiderata.*—Ova, larvæ, and pupæ, living or dead.—*James B. Penhall; Bucklers, Par Station, Cornwall.*

Duplicates.—Euphrosyne, Paphia, Adippe, Sinapis (3), Rhamni,* Argiolus (fine), Lucina, T. Rubi, Hyperanthus, Megacephala,* Duplaris (fair), Rumicis. Vaccinii, Crepuscularia, Albicillata, Maculata, Populata, Tristata, Margaritaria, and Progemmaria. *Desiderata.*—Paniscus, Flavicornis, Ridens, Aceris, Putris, Furuncula, Miniosa, Gracilis, Urticæ, Triplasia, Temerata, Taminata, Adustata, Hastata, Abruptaria, Galiata, Derivata, Defoliaria, Pulveraria, Russula, Hamula, Palpina, Rubiginata, Procellata, and many others.—*W. C. Wells; Oscott Villa, Wylde Green, near Birmingham.*

Duplicates.—Ambigua, Hispidus, Muralis (S. Devon), Haworthii, Tristata, Fumata, Davus, Blandina, Plantaginis * (Scotch), T. Quercus, Brunneata (fair), Obfuscata (fair), Betularia var. Doubledayaria,* Ulmata (white pins), Gothica, Instabilis. *Desiderata.*—Myopiformis, Ichneumoniformis, Globulariæ, A. Urticæ, Quercifolia, Flammea, Straminea, Craccæ, Pastinum, Chaonia, Castaneæ, Ulvæ, &c.—*E. A. Cockayne;* 6, *Tapton House Road, Sheffield.*

Duplicates.—T. Quercus * (fine), Phlœas, Alniaria,* Angularia,* Irrorella (3), Extersaria, Tenuiata,* Rubricosa, Silago,* Cerago,* Megacephala (2), C. Cythera (2), Cassinea* (2), Mendica,* Lanestris,* Popularis, Typica, Dentina, Comma, Vinula, Nictitans, Satellitia, Nupta (3), Versicolor (2), Quercifolia (2), Prodromaria (fine), Quercana* (2). *Desiderata.*—Agathina, Trepida, Præcox, Occulta, Ilicifolia, Dictæa, Bicuspis, Lichenea, Lucernea, Iris, Pruni, and many others.—*Wm. Edwd. Baker; Tilney All Saints, King's Lynn.*

Duplicates.—Paphia, Polychloros,* Blandina, Ægon, Agestis, Populi,* Tiliæ,* Geryon, Caniola, Deplana, Hera, Russula (males), var. Radiata,* Chrysorrhœa,* Monacha, Neustria,* Castrensis,* Antiqua, Illustraria,* Pilosaria (males), Zonaria, Abruptaria, Vernaria,* Inornata,* Pictaria, Juniperata,* Variata, Duplaris, Phragmitidis, Fulva, Lutosa,* Croceago,* Cerago, Rhizolitha,* Libatrix, Sponsa, &c. *Desiderata.*—Bombiliformis, Apiformis, Asellus, Rubi, Lunaria, Eupithecia, Psittacata, Ridens, Lysodea, and others. Lists exchanged.—*A. H. Shepherd;* 81, *Corinne Road, Tufnell Park, London, N.*

Duplicates. —A few of each: Chrysorrhœa,* Neustria,* Bucephala,* Caia,* Cerago,* M. Brassicæ,* Perla, Graminis, Basilinea, Trilinea, Xanthographa, Gothica, Instabilis, Cruda, Macilenta, Rufina, Vaccinii, Spadicea, Satellitia, Ferruginea, Meticulosa, Lucipara, Nebulosa, Pilosaria, Rupicapraria, Leucophæaria, Progemmaria, Brumata, Dilutata, Immanata, &c. *Desiderata.*—Very numerous. *G. Fleming;* 9, *Fairview Terrace, Merthyr Tydfil.*

Duplicates.—Chrysorrhœa,* Falcula,* Nupta, Gamma, S. Populi,* Juniperata, Pistacina, Brumata, Polyodon, Meticulosa. Set on black pins, with data. *Desiderata.*—Numerous.—*J. B. Morris; Maldon House, Maldon Road, Wallington, Surrey.*

Duplicates.—Cratægi (types), Edusa, Hyale, Chrysidiformis,* Autumnaria (Margate), Ochrata, Lutulenta, Ochroleuca, Geminipuncta,* Australis, A. Nemoralis; also to clear, Adonis, Z. Trifolii,* Mendica,* Chrysorrhœa, Illustraria. Citraria, Saucia, Tritici, Vetusta, &c. *Desiderata.*—Pairs of almost any species, to form a type collection.—*J. P. Barrett; St. John's Villas, Margate.*

Duplicates.—Ornithopus, Variata,* Polychloros,* Cinctaria, Paphia, Aprilina. Sibylla,* Macilenta, Pennaria,* T. Quercus,* Lota, Rufina, Monacha,* Fimbria, Gothica, Decolorata, Cervinata,* Lucipara,* Castanea,* Flavago,* Areola, Socia (fair), Valesina (fair), Piniperda (fair), Pictaria (fair), Syringaria (4). *Desiderata.* Numerous.—*L. F. Hill; 2, Freelands Road, Bromley, Kent.*

Duplicates.—Polychloros,* Galatea, Bellargus, Corydon, Salicis,* Lunosa. Serena. *Desiderata.*—Typhon, Betulæ, Ægon, pupæ of S. Ocellatus; or offers.—*Edward H. Solly; 3, South Street, Deal, Kent.*

Duplicates.—Salicis,* Similis,* Filipendulæ,* Megacephala,* Muralis, Fulvago,* Arcuosa, Capsophila,* Capsincola,* Lunosa, Xerampelina, Anomala (4). Gamma, Black Betularia,* Hirtaria,* Strataria,* N. Viridata (6), Fluctuosa, E. Autumnaria (6), Illustraria (4), Lichenaria* (8), Impluviata (5), Brumata, Vitalbata* (5). *Desiderata.*—N. Strigula, Albulalis, Confusalis, Senex, Deplana, M. Castanea, Cultraria, Rufa, Albovenosa, Abjecta, Taraxaci, Ditrapezium, Irregularis, Chrysozona, Lychnitis, Socia, Cordigera, Venustula, A. Strigilata, Amataria, Limbaria, Purpuraria, Birivata, Pygmæata, Castigata, Virgaureata, Fraxinata, Pusilata, Expallidata, Coronata, Simulata, Firmata, Quadrifasciaria, Certata, Associata, Griseata.—*John Taylor; 318, Chadderton Road, Oldham.*

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SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY (Hibernia Chambers, London Bridge, S.E.).—Meetings on the 2nd and 4th Thursdays in each month at 8 p.m.

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—The meetings of this Society (held at the London Institution, Finsbury Circus, E.C.) will take place on the 1st and 3rd *Tuesdays* in each month, from 7.30 to 10 p.m.

NONPAREIL ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY (17, Rahere St., Goswell Road, E.C.).—Meeting nights, 1st and 3rd Thursdays in each month.

NORTH LONDON NATURAL HISTORY SOCIETY.—Meetings are held on the 1st and 3rd Thursdays in each month at the Sigdon Road Board School (close to Hackney Downs Station, G.E.R.), at 7.45 p.m.

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Societies, 30–32.

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LIPHYRA BRASSOLIS, Westw.—Some further remarks on the Larvæ of this Species will appear in an early number.

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SUBSCRIPTIONS FOR 1903 ARE DUE.

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7243

THE
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OF
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WITH THE ASSISTANCE OF

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FEB 21 1903

THE ENTOMOLOGIST

VOL. XXXVI.] FEBRUARY. 1903. [No. 477.

ATTITUDE OF HYBERNATING WASP.

By F. W. Frohawk, M.B.O.U., F.E.S.

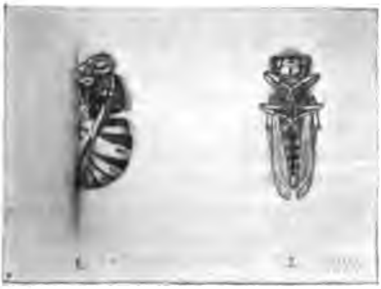

Fig. 1. Fig. 2.

The remarkable attitude assumed by wasps during hybernation appears to have escaped the notice of entomologists, at least I am unable to find any reference to it, excepting the following short note in Westwood's 'Introduction,' published sixty-three years ago. In vol. ii. p. 247, allusion is made to the susceptibility of wasps to the cold, where it states: "I have observed a wasp on a frosty morning in October hanging suspended by its jaws to a curtain, with its wings closely folded between its legs and upon its breast"; excepting the last t of the observation, which should read abdomen instead of ıst, it fairly describes a hybernating wasp.

On Dec. 12th last I had occasion to take down a picture from wall of my bedroom, and noticed on the back, which was of lboard, a wasp which at first appeared to be wingless, and sticking to it as if dead. Upon closer examination I was surprised to find its wings neatly folded up passing over the base of its hind legs and then under, with their ends pressing and lying flat on the cardboard, the hind legs stretched out and resting along the side of the abdomen, the latter being curved with the extremity on the cardboard between the apices of the wings; the other two pairs of legs were folded up with the tarsi crossed under the body; the antennæ closely packed away under the neck and covered with a shining substance apparently excreted from its mouth. I was at first unable to account for the way it was attached to the cardboard, but on carefully examining its jaws I found the ends were firmly fixed into the cardboard, which it had previously gnawed, causing a small portion to become jagged, giving it a firmer grip. Upon turning the picture upside down and giving it a list, the body came slightly away from the backing, but it remained rigidly fixed by its jaws. I then placed the picture aside for a few days, and on Dec. 26th I again examined it, and found it had not moved in any way, so made the two accompanying drawings. After making fig. 1, which represents it as described, I had to remove it to make fig. 2, of the ventral surface, to show the position of the wings, legs, and antennæ. In removing it I had to forcibly pull it off the cardboard; in doing so, it tore away with its jaws the small piece they had gripped.

The only movement I have noticed has been a slight pulsation of the abdomen, although it has remained in a box on a mantelpiece above a fire daily burning for a month.

There can be but little doubt that the wings are folded away, and also the legs and antennæ, during hybernation to protect them from injury, which they would be subjected to from the attacks of mice, beetles, &c., if exposed in the normal position of a wasp while resting when not hybernating.

January, 1903.

ON A METHOD OF PRESERVING THE COLOUR OF THE AGRIONINÆ.

By Stanley W. Kemp, F.E.S.

All collectors of dragonflies must have deplored the way the colour of the small blue and red Agrionidæ disappears on drying. Evisceration which, with care, yields good results in the case of the larger forms, is impossible with these delicate little species. The loss of colour is especially annoying, as the species are, in some cases, distinguished by the markings of the second abdominal segment.

There is, however, a method, which has been tried by Mr. F. W. Terry and myself, which answers remarkably well in most cases, though it has its drawbacks. It will be found useful for the genera *Platycnemis*, *Erythromma*, *Pyrrhosoma*, *Ischnura*, *Agrion*, and *Enallagma*.

The process of preparing for the cabinet is of course rendered more tedious, but will, I think, repay the extra trouble expended on it.

The insects should be killed in the usual way by cyanide, &c., and as soon as dead should be pinned on a narrow piece of cork about an inch and a half wide and eight or nine inches long. The legs should be set out, but not the wings; about a dozen specimens can be pinned out on one piece of cork. The cork, with insects, should now be placed in a wide-mouthed jar full of spirit (methylated is quite good enough) and securely stoppered. After about a month they may be taken out and allowed to dry; the spirit on the wings should be absorbed by blotting-paper, as otherwise they are liable to become clouded. The wings may now be relaxed by touching the joints with wood-naphtha on a camel-hair brush, and the insect set. Care should be taken that the *joint itself* is relaxed and the wing not bent above the joint. The legs must be set before the insect is put into the spirit, as it is impossible to relax them afterwards.

By this process the blue colour of the Agrions is very well preserved; if anything, it turns slightly whiter. The colour of the thorax is also good, and *Ischnura elegans* var. *rufescens* turns out splendidly.

This method cannot be recommended for immature specimens, as the body almost invariably curls and buckles on being taken out of the spirit. Another disadvantage is the tendency which the wings have to become a little cloudy; but this cannot be seen when the insects are arranged in a cabinet-drawer against a white background.

80, Oxford Gardens, Notting Hill, W.

[We have examined several specimens of *Agrion mercuriale* and *Enallagma cyathigerum* thus prepared, and, judging from them, it seems certain that anyone who will take the necessary trouble will, by using Mr. Kemp's method, at last be able to become the possessor of well-coloured series of the Agrioninæ. It would appear that the spirit effectually dries the insects, and at the same time prevents decomposition.—W. J. L.]

THE LARVA OF *LIPHYRA BRASSOLIS*, Westw.

By T. A. Chapman, M.D.

It is necessary to note that an error has occurred in this matter in my short paper in the last volume of the 'Entomologist' (vol. xxxv. p. 225). Mr. Dod writes to the Editor that the larva described as the young larva of *L. brassolis* belongs to another species, and is not that of *brassolis* at all. It matters little to explain how Mr. Dod came to enclose this larva with the *L. brassolis* without knowing he had done so; how Mr. South took it to be the young larva of *L. brassolis*, and handed it to me with the definite statement it was so; or how I detected nothing incongruous in the information. What this larva really is, Mr. Dod does not inform us as yet, beyond that it is that of a moth, and lives with ants.

The larva has a facies that would agree well enough with *Lycæna*, more so, indeed, than the full-grown larva of *L. brassolis* has. It has "macro" prolegs, and is therefore a butterfly, a "macro" or a relative of the Limacodid-Zygæna group; that it is the latter seems most probable.

The curious prolegs of the large larva of *L. brassolis* are, of course, as described, and all that requires altering in what I have said about them that is erroneous, is in seeing their immediate evolution from the form in this moth larva; this may be their evolution, or it may be something very different. It remains true, however, that they present a pseudo-micro form developed from a fully evolved macro-proleg.

For the rest, it will be better to await further facts and materials before saying more, except that I have kept silence for some time, intending to say nothing till these arrived, but have finally concluded that this note is perhaps desirable.

Betula, Reigate: January 2nd, 1903.

ON THE BUTTERFLIES COLLECTED IN EQUATORIAL AFRICA BY CAPTAIN CLEMENT SYKES.

By Emily Mary Sharpe.

(Continued from p. 8.)

Family Papilionidæ.

165. Papilio phorcas, *Cram.* — *a*, ♂. March from Usoga to Nandi; April, 1900.

166. P. merope, *Cram.*—*a*, ♂. March from Usoga to Nandi; April, 1900.

167. P. policenes, *Cram.*—*a*, *b*. March from Usoga to Nandi; April, 1900.

168. P. PYLADES, *Fabr.*—*a*, ♂. Lamogi; November, 1899.

169. P. MENESTHEUS, *Drury.*—*a*. March from Usoga to Nandi; April, 1900.

170. P. DEMODOCUS, *Esp.*—*a*, *b*. Unyoro; March, 1900.

171. P. NIREUS, *Linn.*—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

172. P. BRÖNTES, *Godm.* — *a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

173. P. MACKINNONI, *E. M. Sharpe.*—*a*. March from Usoga to Nandi; April, 1900.

174. P. SIMILIS, *Cram.*—*a*, *b*. March from Usoga to Nandi; April, 1900.

Family HESPERIDÆ.

175. RHOPALOCAMPTA FORESTAN (*Cram.*).—*a*. Wadelai; January-March, 1900. *b*. Unyoro; March, 1900.

176. R. UNICOLOR (*Mab.*).—*a*, *b*. Unyoro; March, 1900.

177. CAPRONA ADELICA, *Karsch.*—*a*. Wadelai; January-March, 1900. *b*. March from Usoga to Nandi; April, 1900.

178. HESPERIA MACHACOANA (*Butl.*).—*a*, *b*. Lamogi; November, 1899.

179. KEDESTES FENESTRATUS (*Butl.*).—*a*. Lamogi; November, 1899.

180. K. WALLENGRENII (*Trimen*). — *a*. Wadelai; January-March, 1900.

181. PADRAONA ZENO (*Trimen*). — *a*, *b*. March from Usoga to Nandi; April, 1900.

182. BAORIS INCONSPICUA (*Bert.*). — *a*. Lamogi; November, 1899. *b*. Wadelai; January-March, 1900.

183. EAGRIS LUCETIA (*Hewits.*).—*a*. Unyoro; March, 1900.

184. SARANGESA ELIMINATA, *Holl.*—*a*. Unyoro; March, 1900.

185. S. MOTEZI (*Wallgr.*).—*a*. Wadelai; January-March, 1900.

186. ERETIS LUGENS (*Rogenh.*).—*a*. Wadelai; January-March, 1900. *b*, *c*. March from Usoga to Nandi; April, 1900.

187. CELÆNORHINUS GALENUS (*Fabr.*). — *a*. Unyoro; March, 1900.

188. CERATRICHIA FLAVA, *Hewits.* — *a*. March from Usoga to Nandi; April, 1900.

HETEROCERA.

Family SPHINGIDÆ.

189. NEPHELE RAFFRAYI (*Oberth.*). — *a*. Wadelai; January-March, 1900.

190. CHÆROCAMPA BALSAMINÆ, *Walk.*—*a*. Wadelai; January-March, 1900.

191. C. ESON (*Cram.*).—*a.* March from Usoga to Nandi; April, 1900.

Family NOCTUIDÆ.

192. SPHINGOMORPHA MONTEIRONIS, *Butl.*—*a.* Wadelai; January–March, 1900. *b.* Unyoro; March, 1900.

193. ACHÆA CATILLA, *Guen.*—*a.* March from Usoga to Nandi; April, 1900.

194. PATULA WALKERI, *Butl.*—*a.* March from Usoga to Nandi; April, 1900.

195. CYLIGRAMMA RUDILINEA, *Walk.*—*a.* Unyoro; March, 1900.

196. ENTOMOGRAMMA PARDUS, *Guen.*—*a.* Wadelai; January–March, 1900.

197. E. NIGRICEPS (*Walk.*).—*a.* Wadelai; January–March, 1900.

198. LEOCYMA sp.—*a.* Wadelai; January–March, 1900.

199. PLECOPTERA sp.—*a.* Wadelai; January–March, 1900.

200. BOMOLOCHA ABYSSINIALIS (*Guen.*).—*a.* March from Usoga to Nandi; April, 1900.

201. TÆNIOPYGIA SYLVINA (*Stoll.*).—*a.* Unyoro; March, 1900.

202. CURUBASA LANCEOLATA (*Walk*).—*a, b.* March from Usoga to Nandi; April, 1900.

Family LIMACODIDÆ.

203. TÆDA PRASINA, *Butl.*—*a.* March from Usoga to Nandi; April, 1900.

204. NATADA sp.—*a.* March from Usoga to Nandi; April, 1900.

Family SABALIADÆ.

205. SABALIA JACKSONI (*E. M. Sharpe*).—*a.* March from Usoga to Nandi; April, 1900.

Family ARBELIDÆ.

206. METARBELA sp.—*a, b.* Unyoro; March, 1900. *c.* March from Usoga to Nandi; April, 1900.

Family CHRYSOPOLOMIDÆ.

207. CHRYSOPOLOMA sp.—*a.* March from Usoga to Nandi; April, 1900.

Family NOTODONTIDÆ.

208. ZANA SPURCATA (*Walk.*).—*a.* March from Usoga to Nandi; April, 1900.

Family HYPSIDÆ.

209. ARGINA ASTREA (*Drury*).—*a.* March from Usoga to Nandi; April, 1900.

Family LYMANTRIADÆ.

210. OLAPA FLABELLARIA (*Fabr.*). — *a.* March from Usoga to Nandi; April, 1900.

211. CROPERA ADSPERSA, *Herr.-Sch.*—*a.* March from Usoga to Nandi; April, 1900.

Family ZYGÆNIDÆ.

212. ARNIOCERA sp.—*a, b.* March from Usoga to Nandi; April, 1900.

Family ARCTIADÆ.

213. DIACRISIA? RHODESIANA, *Hampson*, Cat. Lepid. Phalænæ, vol. iii. p. 296, pl. xlv. fig. 24, 1901. — *a.* March from Usoga to Nandi; April, 1900.

214. D. CURVILINEA (*Walk.*), Hampson, *t. c.* p. 275.—*a.* March from Usoga to Nandi; April, 1900.

215. D. MACULOSA (*Stoll.*), Hampson, *t. c.* p. 276.—*a.* Unyoro; March, 1900.

216. D.? FLAVICOSTA (*Hampson*), *t. c.* p. 322, pl. xlvi. fig. 21.—*a, b.* March from Usoga to Nandi; April, 1900.

217. SECUSIO STRIGATA, *Walk.*, Hampson, *t. c.* p. 491, fig. 219.—*a.* March from Usoga to Nandi; April, 1900.

Family LITHOSIIDÆ.

218. UTETHEISA PULCHELLA (*Linn.*).—*a.* Wadelai; January–March, 1900.

Family AGARISTIDÆ.

219. XANTHOSPILOPTERYX POGGEI (*Dewitz*), Hampson, *t. c.* p. 562.—*a, b.* March from Usoga to Nandi; April, 1900.

These specimens do not quite agree with the typical form of *X. poggei*, the transverse band on the primaries being almost obsolete.

220. X. HORNEMANNI (*Druce*), Hampson, *t. c.* p. 572.—*a.* March from Usoga to Nandi; April, 1900.

221. X. MONS-LUNENSIS, *Hamps.*, *t. c.* p. 570, pl. liii. fig. 10.—*a.* March from Usoga to Nandi; April, 1900.

222. ROTHIA BUTLERI (*Walk.*), Hampson, *t. c.* p. 576, pl. liii. fig. 13.—*a.* March from Usoga to Nandi; April, 1900.

223. ÆGOCERA RECTILINEA, *Boisd.*, Hampson, *t. c.* p. 596.—*a, b.* Wadelai; January–March, 1900. *c, d.* Unyoro; March, 1900.

Family GEOMETRIDÆ.

224. ALCIS ACACIARIA, *Boisd.*—*a.* March from Usoga to Nandi; April, 1900.

225. GONODELA MACULOSA, *Warr.*—*a, b.* March from Usoga to Nandi; April, 1900.

NEUROPTERA.

Family Myrmeleonidæ.

226. **Palpares** sp.—*a*, *b*. March from Usoga to Nandi; April, 1900.

ORTHOPTERA.

Family Cicadidæ.

227. **Platypleura confusa**, *Karsch*.—*a*. March from Usoga to Nandi; April, 1900.

NEW SPECIES OF INDIAN CHRYSIDIDÆ.

By Major C. G. Nurse, Indian Staff Corps.

(Continued from p. 12.)

Chrysis autocrata, n. sp.

♀. Stoutly built; frontal cavity finely, head and thorax somewhat irregularly, the latter coarsely punctured, abdomen, especially 2nd and 3rd segments, more regularly and finely punctured; pronotum distinctly narrower at base than at apex, its shoulders slightly rounded, and having a median longitudinal impressed line at base; 2nd and 3rd abdominal segments distinctly carinated, 3rd segment without subapical foveæ, quadridentate, the inner teeth close together and blunt, the outer teeth smaller, sharper, and not projecting nearly so far back as the inner ones. Head, thorax, and 1st abdominal segment metallic green with blue reflections; 2nd and 3rd segments lighter green, with a golden or coppery effulgence; antennæ piceous; tarsi rufo-testaceous; wings hyaline, nervures and tegulæ brownish testaceous; head, sides of thorax and abdomen, and legs with some sparse rather long pubescence. Long. 8·5 mm.

Hab. Quetta; two specimens.

Chrysis hoggei, n. sp.

♂. Head, thorax, and abdomen of equal width, closely, regularly, and deeply punctured, the 2nd and 3rd abdominal segments more finely so than the rest of the body; an impressed median longitudinal line on pronotum, not reaching its apex; apical abdominal segment quadridentate, the teeth blunt, with a row of subapical foveæ. Dark metallic bluish green, the scutellum sometimes green with a slight golden effulgence; flagellum of antennæ dark rufous; all the tarsi pale testaceous at base, becoming slightly darker at apex; pubescence white, short, and sparse, except on the front, where it is longer and thicker; wings hyaline, nervures black, tegulæ dark blue. Some specimens are almost entirely dark blue, without any green shade. Long. 6–7 mm.

Hab. Quetta; a few specimens.

I have named this species after Lieut.-Col. Hogge of my regiment, as he sent me the first specimen I obtained.

CHRYSIS THALIA, n. sp.

♂ ♀. Slenderly built, of equal width throughout; head, thorax, and abdomen closely, regularly, and somewhat finely punctured; front concave, very finely rugose; pronotum with its "shoulders" rather sharply angled, and with a median longitudinal indentation at base; 2nd and 3rd abdominal segments with a trace of a carina; apical segment quadridentate, the teeth sharp, with a row of deep subapical foveæ. Dark blue, with green and sometimes purple reflections, the latter especially at the apex of the 2nd abdominal segment; flagellum of the antennæ, and tarsi piceous, the anterior and posterior tarsi sometimes inclining to testaceous; pubescence greyish and sparse; white, thicker, and longer on the front; wings clear hyaline, nervures dark testaceous, tegulæ dark blue, finely punctured. Long. 6–7 mm.

Hab. Quetta.

This species appears to be near to *C. seraxensis*, Rad., but is slightly larger, is cylindrical in shape, and the tarsi are usually piceous and not rufous.

CHRYSIS QUETTAENSIS, n. sp.

♀. Of equal width throughout; head and thorax closely but not very finely, abdomen more finely and regularly punctured; front concave, very finely punctured or rugose; head and pronotum subequal, the latter wider at apex than at base, with a median longitudinal indentation at base; 2nd abdominal segment with a trace of a carina, 3rd segment quadridentate, the teeth moderately sharp, with deep subapical foveæ. Head and thorax metallic green, the central quadrate division of the mesonotum, and the sides of the thorax with more or less blue reflections; abdomen lighter green, with golden and coppery reflections, especially on the 2nd and 3rd abdominal segments; apex of 3rd segment deep blue; legs greenish blue; flagellum of antennæ and tarsi reddish black; wings hyaline, nervures very dark testaceous, almost black, tegulæ dark blue. Long. 6–8 mm.

Hab. Quetta; common.

CHRYSIS BALUCHA. n. sp.

♂. Of equal width throughout; head, thorax, and abdomen closely, but not very finely punctured; front concave, the sculpturing hidden by the pubescence; head and pronotum subequal, the latter with the "shoulders" rather sharply angled, and with a median longitudinal indentation at base; 2nd segment with a trace of a carina; 3rd segment quadridentate, the teeth rather sharp, and with deep subapical foveæ. Dark blue, with greenish reflections; flagellum of antennæ and tarsi light rufo-testaceous; wings clear hyaline, nervures dark testaceous, tegulæ dark blue. Long. 6–8 mm.

Hab. Quetta; common.

I believe this species to be the male of *C. quettaensis* above, but I have no evidence other than that both are very common at Quetta, are much the same size, and that I obtained only males of one and females of the other. I think, therefore, that it is better to keep them apart until better evidence of their affinity is obtained.

CHRYSIS ARRESTANS, n. sp.

♀. Head and thorax coarsely, abdomen finely punctured; head and thorax very slightly narrower than abdomen; clypeus emarginate anteriorly; a well-defined sinuate transverse ridge below anterior ocellus, and the front below it concave, with sparse white pubescence, under which is finely punctured; head, viewed from above, nearly twice the size of pronotum, the latter with a median longitudinal depression; 1st abdominal segment almost impunctate in the centre, 2nd segment with a median longitudinal carina, 3rd segment sexdentate, the teeth sharp, and with a subapical row of foveæ. Dark blue-green, with a purple tint in some lights; the clypeus, mandibles at base, and scape of the antennæ bright metallic green; mandibles black in the centre, red at apex; 2nd abdominal segment green at apex; antennæ and tarsi dark red, almost black; wings hyaline, tegulæ purple, radial cell not quite closed. Long. 6 mm.

Hab. Deesa; a single specimen.

CHRYSIS ORIENTALIS (Guér.).

This species, which is common at Deesa, varies very much both in colour and size. M. du Buysson says, in the Journal of the Bombay Natural History Society, vol. x., p. 477, that "le 2ᵉ segment abdominal porte de chaque côté, à sa base, une petite tache bleu-foncé." This is by no means invariably the case, and quite half my specimens are without this spot. In length this species varies from 6·5 to 13 mm., and in expanse from 13 to 24 mm.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

BY DR. H. J. HANSEN.

(Continued from vol. xxxv. p. 263.)

OF the division of the Auchenorrhyncha into these four families, which was proposed by Stål with a subtle systematic insight, but which, as a matter of fact, not a single subsequent author has accepted, I have now drawn up the numerous exclusive characters—brought forward in this conspectus—so that its prevalency may be considered as in some degree proved, and it ought perhaps to result that in future not many systematists will arbitrarily erect new families on a basis of a somewhat peculiar habitus. It is also my conviction that even in view of the possibility of one or other of these characters not proving so exclusive as I have thought, in researches upon a considerable exotic material, an extended study of the structure of these insects will give so many new characters for the same families, that the loss will be more than compensated for, consequent, of course, upon the supposition that real links, unknown to me and so far undescribed, are not discovered. I may, for example, mention that in the Cercopidæ, but not in the three other families, the larvæ have the abdominal pleural parts very divergent from the adults; in the same way the antennæ in the Cercopidæ undergo a noteworthy change of structure, described above, by which last-mentioned circumstance this family is distinguished from the other Auchenorrhyncha. That the larvæ of Stridulantia possess remarkably powerful anterior legs, adapted for digging, is well known; that, on the other hand, the structure of their claws is totally different from that of the imagines is a very peculiar fact not widely esteemed. For the lack of adequate material I must, meanwhile at least, refrain from dealing further with metamorphosis in the different families, and be content with this intimation of its use for systematics.

V.

The principal difficulty still remains to be dealt with, *viz*. a division into sharply characterized groups of these families, of which the Jassidæ and Fulgoridæ have been so notably endowed by nature with genera and species. Just so easy as division and characterization of these families have appeared to me, just so difficult did it appear to effect a dismemberment of the Jassidæ, and particularly of the Fulgoridæ, and that in spite of the fact that surely not within a single family of insects are there found such strong differences in habitus, in the form of the head and prothorax, and in the structure of the wings, as actually in these two. The material of the Copenhagen Museum, and that of it that I could dissect for microscopical researches, was, particularly in the Fulgoridæ, too meagre for sharp circumscription of groups. I will now set forth my opinions, with constant reference to Stål's above-mentioned (on p. 28)* proposals in 'Hemiptera Africana.'

1. *Stridulantia.*—It appears to me very probable that this family is susceptible of division into good groups. Stål has scarcely essayed this. The division into two groups, based upon the flight-organs, by Amyot and Serville, is perhaps a practical help in identification; but it is seen to be without scientific value, as in the first little group there are placed such extremely diverse genera as *Polyneura*, Westw., and *Cystosoma*, Westw. (as well as the certainly highly interesting *Hemidictya*, Burm., unknown to me), separated from forms with which they have far stronger relationship than mutually with one another.†

2. *Cercopidæ.*— Stål's groups in the 'Hemiptera Africana'

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* Not translated.—G. W. K.

† Dr. Hansen wishes me to say that at the time of writing these, he was not aware of the existence of Distant's 'Monograph of Oriental Cicadidæ,' 1889–92 (a work scarcely to be found in Denmark), where this family is divided into two primary groups, based upon the covered or uncovered (speaking generally) condition of the tympana (p. 8).—G. W. K.

appear satisfactory. I cannot make fresh contributions to their establishment.

3. *Jassidæ.*—Stål has the merit of having, in 1866, brought together again the Membracidæ and the typical Jassidæ into one family. This he divides into seven groups, of which the first six together practically agree with the family Membracidæ founded by Burmeister. The principal qualities, good and bad, of this division will be discussed now.

Amyot and Serville employed as distinguishing features between their *Conidorsi* and *Planidorsi* the prolongation of the prothorax backwards over the abdomen, or the absence of this circumstance. This character appears—especially after a genus like *Tolania*, Stål, is discovered—absolutely useless, for this form, which is throughout akin to *Centrotus*, must be referred, according to Amyot and Serville, to the *Planidorsi*. This Stål has perceived, and he employs in the 'Hemiptera Africana,' for the separation of five of the first groups from the "Jassida," other characters as well, among which that which is based on the form of the lateral margins of the head (dilated or not) is the best.

(To be continued.)

MISCELLANEA RHYNCHOTALIA.—No. 6.

By G. W. Kirkaldy, F.E.S.

Onychotrechus, gen. nov.

Closely allied to *Gerris*, subgenus *Limnogonus*, Stål, and intermediate between the latter and *Eotrechus*, Kirkaldy. It differs from the former by the long posterior claws, and from the latter by the claws being somewhat post-apical and inserted in a cleft in the tarsi. Type, *O. rhexenor*, Kirkaldy.

General appearance of *Limnogonus*, but duller and more pubescent. Rostrum reaching to about middle of mesosternum. Antennæ a little shorter than length of body; first segment shorter than any two others together. The intermediate and posterior legs each more than twice as long as body. Second segment of anterior tarsi three times as long as first.

O. rhexenor, sp. nov.

Dull blackish grey with sparse pale yellow pubescence; a median longitudinal stripe on vertex continued on to anterior lobe of pronotum, a lateral line on each side of vertex (anterior to the eyes), two lateral lines on each side on the anterior lobe of pronotum, lateral margins of sterna—pale flavous with a pink tinge; lateral margins of posterior lobe of pronotum greyish white. Elytra pale fuscous. Antennæ dark fuscous, first segment paler beneath basally; legs more or less dark fuscous, paler beneath. Head beneath and prosterna (except laterally), ambulacra, genital segment, testaceous; rest of ventral surface blackish grey. Antennæ: first segment twice as long as head, one-third longer than second, which is one-half longer than third, fourth one-fourth longer than third. Posterior lobe of pronotum superficially carinate longitudinally, subtectiform, rounded posteriorly. Anterior femora scarcely incrassate; intermediate femora three-sevenths longer than tibiæ, which are somewhat more than five times as long as the subcylindrical tarsi. Second tarsal segment about two and a half times as long as first, and about twice as long as claw. Posterior legs of similar proportions. Elytra reaching beyond apex of abdomen.

♂. Abdomen beneath: fourth to seventh segments laterally somewhat compressed, medio-longitudinally sulcate. Apical margin of seventh segment roundly but not profoundly emarginate; eighth a little longer medianly than seventh; ninth about equal to eighth. Long. excl. elytr. 5·8 mill.; lat. max. 1·7 mill.

Hab. South India; Kanara.

I have seen a single male of this interesting form, kindly communicated to me for examination by Mr. Distant.

FIVE NEW COCCIDÆ FROM MEXICO.

By T. D. A. Cockerell.

Mytilaspis mimosarum, n. sp.

♀. Scale 2 to 3 mm. long, brownish white, narrow, convex, usually curved; exuviæ orange-brown. ♂ scale as usual. Compared with the next species (*M. townsendiana*) the scales are larger, and not so pure white.

♀. Adult. Colour (after boiling in KHO) greenish or pale orange, the anterior end sometimes slightly pinkish. Five groups of circumgenital glands; median of 9, anterior laterals 16 to 18, posterior laterals 9 to 10. Only one pair of distinct lobes, these large and brownish, rounded, slightly crenulated or entire, separated by an interval in which are two pointed squames. A pair of pyriform glands at the base of each median lobe, but quite at the lateral margins, though the outer one is curved inwards; second lobe represented by two colourless minute lobules, the inner one the larger; after this come a spine and a pair of large spine-like squames; then two broad and very low eminences representing the third lobe, the second usually minutely crenulate; then a spine and two very large spine-like squames; then after a considerable interval two or three more spine-like squames, and three such on the lateral margins of each of the next three segments. None of the segments have their lateral margins noticeably produced. Submarginal transverse glands as usual; dorsal glands as usual, not especially numerous. Anal orifice about opposite the median group of circumgenital glands, and 138 μ distant from tips of median lobes. Skin minutely striated throughout. Length of the longest squames, 24 μ.

♀. Second stage. Colour (after boiling) pale yellowish brown; one pair of large low lobes; large squames.

Larva.—Rather elongate; colour (after boiling) pale greenish, with usually a large brown spot in the region of the mouth; eyes blue; spines large; the two caudal lobes look like long-fanged incisor teeth, but only project above the margin as two very minute nodules.

Hab. Zapotlan, Mexico; crowded on small branches of *Mimosa* sp., July 6th (*C. H. T. Townsend*).

MYTILASPIS TOWNSENDIANA, n. sp.

♀. Scale 2 mm. long, convex, narrow, often curved; white, with orange-brown exuviæ. ♂ scale as usual.

♀. Adult. Colour (after boiling in KHO) pale yellowish green; the two segments anterior to the terminal portion much produced at the sides, into rounded lobes directed backwards, these lobes having many round glands. No circumgenital glands, but numerous round dorsal glands, much as in *M. ulmi;* a curved band of these glands on each side of the anal orifice, simulating a continuous band of circumgenital glands, but differing by the glands being smaller and not so close together, irregularly placed. Transverse submarginal glands of the usual type. Small pyriform marginal glands of the usual type; two under each median lobe; two under the first (larger) portion of second lobe, the first of these small; two very small ones under the small portion of second lobe; a large one under each half of third lobe; four others under projections of the margin beyond. Spines rather large; squames not large. Lobes striated; median lobes not far apart, large, rounded, and entire; second lobes divided into a large inner and small outer lobule, the inner minutely crenulate on its outer slope; third and fourth lobes each represented by a couple of low crenulated processes, those of the fourth much broadest; one or two pointed processes on the margin beyond. The margin beyond the third lobe might be said to be irregularly serrate. Antennæ with two bristles. Anal orifice to tips of median lobes about 114 μ; breadth of median lobes about 12 μ.

♀. Second stage. Colour (after boiling) pink. Lobes formed as in adult, but second lobe is low and entire.

Larva.—With two large low lobes, widely separated. Femora swollen.

Hab. Colima, Mexico; abundant on small branches of "garabatillo," July 13th (*C. H. T. Townsend*). Easily separated from *M. alba* by the narrower scale and entire median lobes.

NEOLECANIUM LEUCÆNÆ, n. sp.

♀. Large and very convex, but not constricted at base; long. 10, lat. 6¼, alt. 6 mm., varying to long. 8½, lat. 7, alt. 6½ mm., rather dark ferruginous, not very shiny, not tuberculate, more or less covered with small patches of dull white waxy secretion; sides pitted. Legs and antennæ absent. Skin (after boiling) orange-ferruginous, with numerous round or oval gland-pits, mostly rather large, but in places the skin shows only very minute glands. Skin mottled with brown in a more or less radiate manner. Anal plates surrounded by a hyaline area; the plates triangular, with rounded corners, the anterior lateral side much longer than the posterior lateral. Mouth-parts small. Measurements in μ:—Diameter of larger dermal glands, 15 to 33; anal plate, long. 210, lat. 126.

Larva.—Quite ordinary; oval; stigmatal spines in threes, one large and two small; marginal bristles few, simple; last joint of antenna 36 μ long.

Hab. Zapotlan, on *Leucæna* sp., July 7th (*C. H. T. Townsend*). It is preyed upon by some lepidopterous larva. *N. leucænæ* is closely allied to *N. chilopsidis*, but the scale is not so dark, and the skin is different, the larger glands being larger, and not occupying the same area as the minute ones.

AKERMES COLIMÆ, n. sp.

♀. Scale about 5 mm. long, ferruginous or coffee-colour, with a partial covering of a sort of snuff-coloured tomentum, which also covers the inside of the gall. They are shrunken, but appear to have been nearly globular. Anal plates small and corrugated, surrounded by a dark thickened area. The surface of the scale when seen with a lens appears dullish ferruginous, minutely marbled and spotted with black. No sign of any waxy or glassy secretion.

Boiled in KHO, they scarcely colour the liquid; but upon being placed in very dilute KHO an abundance of a dark madder-red pigment is given into solution; in strong KHO this pigment becomes lilac, and more or less of a blue flocculent precipitate appears. Nitric acid does not restore the madder-red colour. The insect remains brown after prolonged boiling. The skin is distinctly tessellated in places, the tesseræ being about 12 μ diameter. Marginal spines small and tapering (about 18 μ long), not numerous, placed in an undulating row. Some round gland-pits, about 27 μ diameter. At least two transverse bands of spines, these spines numerous and crowded, some as long as 42 μ; connected with these bands are patches (about 175 μ diam.) of very distinct round glands (about 6 μ diam.), placed at varying distances apart. Where the spine-bands reach the lateral margins (apparently in the region of the stigmata), some of the spines are very long and branched at the end. No legs or antennæ found. Tracheal tubes large, 30 to 90 μ diameter.

Hab. Cualata, Colima, July 28th; in large hollow pyriform twig-galls (about 18 mm. diam.) on a tree 12 to 20 ft. high (*C. H. T. Townsend*). The galls are certainly not made by Coccids; they are inhabited by ants, but may be lepidopterous or coleopterous in origin. *A. colimæ* is a remarkable species; it is to be regretted that the larva is unknown.

PSEUDOCOCCUS [DACTYLOPIUS auctt.] CUALATENSIS, n. sp.

♀. Length about 2 mm., entirely covered dorsally with dense white secretion, very much as in *P. pseudonipæ* (Ckll.); on boiling, does not stain liquid; after boiling, colour very pale pinkish, legs and antennæ light brown. Labium about 150 μ long and 84 broad. Skin with the usual round glands, and rather numerous minute hairs; bristles of anal ring about 75 μ, caudal bristles about 120. Legs rather stout and short, with large claws; tibia and tarsus with numerous bristles; digitules filiform, with minute knobs. Antennæ 8-jointed.

Measurements of legs and antennæ in μ:—

Anterior leg; length of femur + trochanter 198, of tibia 90, of tarsus 51.
Hind leg; „ „ „ 225, „ 120, „ 51.
Anterior leg; width of femur 69, of tibia 42.
Length of antennal joints: (1.) 39–48, (2.) 36, (3.) 28–30, (4.) 15–18, (5.) 18–27, (6.) 21–24, (7.) 30–33, (8.) 57–60.

Larva.—In ♀, about 580 μ long, with legs and antennæ well developed; shape ordinary; antennæ 6-jointed, joints measuring in μ: (1.) 24, (2.) 30, (3.) 18, (4.) 16, (5.) 16, (6.) 51.

Hab. Cualata, Colima, July 28th (*C. H. T. Townsend*). Quite numerous in the same galls as *Akermes colimæ*. *P. cualatensis* differs from *P. pseudonipæ* in its legs and antennæ; it also differs from *P. nipæ* (Maskell), especially by the short and stout legs. The antennæ seem invariably 8-jointed, and are rather after the manner of *P. neomexicanus* (Tinsley).

Note on the ant associated with Coccidæ at Cualata.

Some of the ants found at Cualata in the galls with *Akermes colimæ* and *Pseudococcus cualatensis* were referred to Professor W. M. Wheeler, of the University of Texas, who kindly reports as follows:—

"The ant is *Azteca longiceps*. Emery. It agrees perfectly with Emery's figure and brief description of a single dealated queen from Alajuela, Costa Rica. These ants of the genus *Azteca* live regularly in the modified stems of tropical trees in what is usually regarded as a case of typical symbiosis. The trees inhabited are mainly of the genus *Cecropia*, and I suspect that the cases observed by Prof. Townsend belong to this group of plants. Emery, in his monograph of the genus *Azteca*, also mentions the occurrence of *A. depilis* in vesicles on the leaves of *Tococa coronata*, Benth. Fritz Mueller, Belt, and Emery all record the occurrence of Coccids with species of *Azteca*, but they do not appear to have described the species. You would undoubtedly find much material on this subject in Schimper's 'Die Wechselbeziehungen zwischen Pflanzen und Ameisen im tropischen Amerika'" (litt., Oct. 26th, 1902).

It may be added that in Trinidad *Palæococcus rosæ* and *Coccus nanus* are found in the runs of *Azteca chartifex*, Forel. *Coccus nanus* is the same as *Lecanium nanum*, Ckll., 1896.

T. D. A. C.

East Las Vegas, New Mexico, U.S.A.:
Oct. 30th, 1902.

NOTES AND OBSERVATIONS.

Aberration of Enallagma cyathigerum.—As Mr. Lucas was looking at some of my specimens of *E. cyathigerum*, he noticed that the black pterostigma was absent from the left hind wing of a male that was taken in the New Forest in August last. Examination with a lens shewed that the neuration at the tip of the same wing was also aberrant. Though the pterostigma is so small, its absence from the wing is very striking. Dr. Chapman suggests that the cause must be sought for in an injury received during one of the earlier instars.—S. W. Kemp; Notting Hill, January, 1903.

Hilara viridis.—A number of years ago I found a new fly in Jamaica, which Mr. Coquillett in 1895 described as *Hilara viridis*. The insect was quite out of the known range of *Hilara*, and the green colour was peculiar, but there was no other genus to receive it. Upon receiving recently Mr. A. L. Melander's excellent monograph of the North American Empididæ, I became convinced that the fly belonged to the Mexican and West Indian genus *Lamprempis*, Wheeler and Melander, 1901. I accordingly wrote Mr. Melander, who kindly gave me an example of *Lamprempis*, which I communicated to Mr. Coquillett, who now assures me that my opinion is correct. The species will therefore be *Lamprempis viridis* (Coq.)—T. D. A. Cockerell.

CAPTURES AND FIELD REPORTS.

Psocidia at Missenden, Bucks.—On Sept. 12th I had a day's collecting at King's Hill, near Great Missenden, Bucks. By beating in a small wood, which consisted mostly of conifers with a little oak and ash, I obtained seven species of Psocidia. Of these, the most striking and at the same time the most abundant species was *Cæcilius fuscopterus*, Latreille. *C. flavidus*, Stephens, was common, while a few *C. obsoletus*, Steph., were met with. A single *Psocus longicornis*, F., was beaten from oak, and other species were *Stenopsocus cruciatus*, Linné, *Peripsocus phæopterus*, Stephens, *Elipsocus flaviceps*, Steph.—Stanley V. Kemp, F.E.S.; 80, Oxford Gardens, Notting Hill, W.

The Dragonflies of Epping Forest.—After a prolonged period of cold winds and cold rains, which greatly retarded the appearance of dragonflies and restricted their number, towards the end of May the weather became warm and bright. On the 25th of that month we made our first capture, a solitary male of *Pyrrhosoma nymphula*. This event was followed on 1st June by a female *Leptetrum quadrimaculatum* being taken at rest; the right hind wing was much aborted. On the same morning we took immature specimens of *Agrion puella*, of both sexes; we observed pairs *in cop.* on 22nd June. *Ischnura elegans*, *Anax imperator*, and *Libellula depressa* were all taken for the first time on 26th June, and several empty nymph-cases of *A. imperator* were also found on the same occasion. On 9th July we took, at Walthamstow, a solitary specimen (female) of *Enallagma cyathigerum;* we had considered this species, at one time tolerably plentiful, to be locally extinct, for our last recorded capture in the Epping Forest district was made as long ago as 10th July, 1887. *Sympetrum striolatum* was especially late in appearing, for we did not take that species until 3rd August. *S. sanguineum*, usually a common insect in the forest, was not met with at all. *Æschna cyanea* was first taken on 9th August, but, although we saw *Æ. grandis* on one or two occasions, we failed to secure any specimens. We kept under observation that most elusive of insects, *Æ. mixta*, from the second week in September to 5th October, but, despite our having devoted several entire mornings to its pursuit, it was not until the day named that we made a capture; the specimen taken was a female. The following are the latest dates upon which we took the species mentioned:—*P. nymphula*, 13th July; *I. elegans*, 18th July; *A. puella*, 3rd August; *Æ. cyanea*, 8th September; *S. striolatum*, 19th October.—Frederick William Campion, Herbert Campion.

Odonata in Norfolk.—I was in the Norfolk Broads June 25th to 31st, and spent a couple of mornings at dragonflies. *Orthetrum cancellatum* was fairly common, both sexes, and I managed to get a few. *Libellula fulva* was also about, and I took nine—five males and four females. I had to let most of the *O. cancellatum* go, as I had only a muslin sleeve for dragonflies. I had not gone out prepared for such large game, as we were working in the reed-beds, and only when we were not getting much in the lepidopterous line did I look about for other things. I caught one or two *Æschna grandis*. On July 29th I went down again, and when cutting reeds for pupæ of *Nonagria cannæ*, I saw what I believe was *Æ. isosceles*. It settled quite close to me, and I could make out the markings quite plainly, I had no net with me, so I tried to grab it, but failed, and it disappeared. I should not like to record it definitely, as I did not actually take it, but I am almost certain it was the right thing. It was rather late for it, but then the season was all out of gear, at any rate amongst Lepidoptera.—H. M. Edelsten; Enfield, Middlesex, Dec. 17th, 1902.

Lepidoptera at Light, &c., in Herts, 1902.—In accordance with my annual practice I append notes on the Lepidoptera I have met with in this county during the year. As a whole the season has not come up to the average of the last few years. As before, my light-trap was responsible for the best captures, and the following were new to my list for this particular locality:—

Smerinthus populi, *Notodonta dictæoides* (one), *Noctua brunnea*, *Cleoceris viminalis*, *Cucullia umbratica*, *Ellopia prosapiaria* (*fasciaria*), *Eurymene dolabraria* (two), *Selenia illustraria* var. *æstiva*, *Pseudoterpna pruinata* (*cytisaria*), *Asthena luteata*, *Acidalia dilutaria* (*osseata*), *Macaria liturata*, *Emmelesia alchemillata*, *Eupithecia castigata*, *E. assimilata*, *E. sobrinata*, *Aglossa pinguinalis*, *Scoparia mercurella* (*frequentella*), *Crambus geniculeus*, *Phycita roborella* (*spissicella*), *Salebria betulæ*, *S. formosa* (four), *Hypochalcia ahenella* (one), *Eurhodope advenella* (four), *Euzophera pinguis*, *Ephestia elutella*, *Tortrix unifasciana*, *Dictyopteryx læflingiana*, *D. bergmanniana*, *Penthina cynosbana*, *Spilonota ocellana*, *S. rosæcolana*, *Sericoris urticana*, *Carpocapsa splendidana*, *Yponomeuta vigintipunctatus*, *Y. cagnagellus* (*cognatella*), *Phibalocera quercana*, *Depressaria flavella* (*liturella*), *Œcophora pseudospretella*.

Of those which had occurred here before, the following may be mentioned:—

Gastropacha (*Lasiocampa*) *quercifolia*, *Drepana falcula*, *D. binaria* (*hamula*), *Pterostoma palpina*, *Axylia putris*, *Xylophasia lithoxylea* (one; this species has been scarce for some years), *Dipterygia pinastri* (*scabriuscula*), *Neuronia popularis*, *Cerigo matura*, *Luperina cespitis*, *Miana fasciuncula*, *M. bicoloria* (*furuncula*), *Petilampa* (*M.*) *arcuosa*, *Agrotis puta*, *A. porphyrea* (*strigula*), *Noctua triangulum*, *Calymnia pyralina*, *C. diffinis*, *Hadena thalassina*, *Plusia moneta* (fairly common), *Selenia lunaria*, *Ennomos erosaria*, *Acidalia imitaria*, *Timandra amataria*, *Eupithecia subfulvata*, *E. pulchellata*, *E. subnotata*, *Cidaria pyraliata*, *C. associata*, *Pelurga comitata*, *Eubolia plumbaria*, *Herminia tarsipennalis*, *H. grisealis*, *Pyralis farinalis*, *Crambus hortuellus*, *Aphonia sociella*, *Tortrix heparana*, *T. fosterana* (*adjunctana*), *Peronea variegana*, *Penthina betulætana*, *P. ochroleucana*, *Xanthosetia zoegana*, and *X. hamana*.

I tried sugaring in August and September both at Bushey Heath and Bricket Wood, but it was slow work, captures being few and far between. The following, among others. were taken:—*Asphalia diluta* (common), *Agrotis suffusa* (both sexes fairly common), *Noctua plecta*, *Triphæna fimbria*, *Amphipyra pyramidea*, *Mania maura*, *Xanthia citrago*, *Polia flavicincta*, *Hadena protea*, *Catocala nupta*, and *Hypæna rostralis*.

At the end of June I had a day's collecting in the north-west part of the county, in the chalk district. *Lycæna bellargus* (*adonis*) males were fairly plentiful, but only one female fell to my lot. I also took *L. alsus* (*minima*) and *Carpocapsa grossana*, the latter beaten out of beech.

I was pleased to find *Hesperia thaumas* (*linea*) at the same locality in August, but only in limited numbers. (Although this is generally considered to be a common "skipper," I have never seen it in abundance anywhere round here). I was rather too early for *Hesperia comma* and only saw two males, but *Lycæna corydon* swarmed as usual. *Eubolia limitata* (*mensuaria*) and *E. bipunctaria* were also taken.

I am indebted to Mr. Richard South, and also to Mr. C. G. Barrett, for having named for me some of the more obscure species mentioned above.—Philip J. Barraud; Bushey Heath, Herts.

Autumn Notes from the Salisbury District. — I have been in Salisbury since about the middle of September, and my notes are from September 18th to December. With the exception of one or two evenings at the street-lamps, very little serious collecting has been done, but the results, I venture to think, on the whole, are satisfactory, and I eagerly await the summer of 1903 for working the district. To start with the butterflies: *Gonepteryx rhamni* was common, and was seen up to the 25th October. *Pieris brassicæ* and *P. napi* were both about in September, the last I saw of the former being on October 12th. *Vanessa urticæ* was common enough, and was seen as late as the beginning of November. *V. atalanta* was also seen up to October 16th. Other butterflies noticed were *Epinephele ianira*, *Cœnonympha pamphilus*, *Chrysophanus phlæas*, and *Lycæna icarus*, an apparently quite fresh example of *C. phlæas* being seen October 8th.

On September 26th I cycled over to Lyndhurst, and spent a very short time in the New Forest, where I found *Dryas* (*Argynnis*) *paphia* and *Satyrus semele* still out, and also saw *Vanessa io*. Three species of dragonflies were noticed:—*Sympetrum striolatum*, *S. scoticum*, and *Æschna* (*? cyanea*), the first-named species also being seen at Salisbury. I also came across three or four dead grass-snakes, from one of which I obtained a specimen of the beetle *Silpha littoralis*.

To return to Salisbury and moths. Treacle was tried in the garden on several occasions, but it was a failure, *Anchocelis pistacina*, *Xanthia ferruginea*, and *Cerastis vaccinii* being the only moths attracted. The ivy in the garden was equally unattractive, *Orthosia lota* being the only addition. The street-lamps, however, were very productive, moths being plentiful on them both by day and night. Species taken at light:—*Pœcilocampa populi* (a few males), *Petasia cassinea* (three), *Nonagria typhæ* (one, Oct. 29th), *Agrotis suffusa* (Oct. 29th), *Diloba cæruleocephala* (common), *Noctua c-nigrum* (up to Oct. 29th), *Polia flavicincta*, *Anchocelis pistacina*, *Orthosia lota*, *Plusia gamma*, *Miselia oxyacanthæ*, *Phigalia pilosaria* (one male, Dec. 1st), *Himera pennaria* (abundant and very variable, all males), *Hybernia defoliaria*, *Oporabia dilutata* (common), *Cheimatobia brumata* (very abundant), *Cidaria miata* (a few), *C. truncata* (or ? *immanata*) (up to Oct. 24th), *Botys ferrugalis* (one, Oct. 24th).

Of insects taken by other means *Polia flavicincta* occurred on walls up to October 8th, and the following were also noticed:—*Bryophila perla*, *Anchocelis rufina*, *Xanthia silago*, *Hadena protea*, *Xylina rhizolitha*, *Orgyia antiqua*, and *Pionea forficalis*. Larvæ were taken of *Sphinx ligustri*, *Chærocampa porcellus* (Oct. 8th), *Lasiocampa quercus*, *Spilosoma lubricipeda*, *Lophopteryx camelina* (Oct. 26th), *Phalera bucephala*, *Acronycta tridens* (one), *A. psi*, *Abrostola urticæ*, *Mamestra brassicæ*, *M. persicariæ*, *Amphidasys betularia*, *Pieris brassicæ*, and *P. rapæ*. The dates appended show how late many of the species were in one of the worst seasons for collecting I have ever experienced.—F. M. B. Carr; The Choir School, The Close, Salisbury.

Lepidoptera in Hertfordshire, 1902.—As so many lepidopterists appear to have met with very poor results during last year, I thought some remarks on the species which came under my notice in this county might perhaps be of interest.

In all I have notes on rather more than 220 different species, which I think is a fairly respectable total.

As has been observed by other writers in this Journal, the best and, at times, the only way of obtaining perfect insects was by the employment of light. By this means I obtained about 185 species, some 40 of which were new to my list for this locality (Bushey Heath). The best captures in this line were:—

Lasiocampa quercifolia, *Drepana binaria* (*hamula*), *Notodonta dictæoides* (one), *Luperina cespitis*, *Agrotis porphyrea* (*strigula*), *Hadena thalassina*, *Calymnia pyralina*, *Plusia moneta*, *Ellopia prosapiaria* (*fasciaria*), *Eurymene dolabraria*, *Selenia lunaria*, *Asthena luteata*, *Macaria liturata*, *Aglossa pinguinalis*, *Phycita roborella* (*spissicella*), *Salebria betulæ*, *S. prunosa*, *Hypochelia ahenella* (one), *Eurhodope advenella*, *Euzophera pinguis*, *Ephestia elutella*, *Tortrix unifasciana* (one female dark form), *Dictyopteryx lœflingiana*, *D. bergmanniana*, *Penthina ochroleucana*, *P. cynosbana*, *Spilonota ocellana*, *S. rosæcolana*, *Sericoris urticana*, *Carpocapsa splendidana*, *Xanthosetia zægana*, *Yponomeuta vigintipunctatus*, *Y. caghagellus*, *Depressaria flavella* (*liturella*).

Sugaring was useless until the end of August, but between the 26th of that month and October 10th I obtained twenty-seven species, among which were *Agrotis puta*, *A. suffusa*, *Noctua c-nigrum*, *Triphæna fimbria*, *Amphipyra pyramidea*, *A. tragopogonis*, *Mania maura*, *Xanthia citrago*, *Hadena protea*, *Catocala nupta*, *Hypæna rostralis*, *Pyralis costalis* (all at Bushey Heath); and *Asphalia diluta* and *Polia flavicincta* (at Bricket Wood). *Plusia moneta* occurred in some numbers at the end of July in our garden, and we took a fair number at dusk, hovering over larkspur. *P. gamma* and *Oporabia dilutata* were quite as plentiful as usual, if not more so.

I was not able to devote much time to the Rhopalocera, but the following were noticed in the Tring neighbourhood:—*Lycæna bellargus* (*adonis*), males fairly plentiful, one female (June 27th); *L. alsus* (*minima*) (same date); *L. corydon*, swarms (August); *Hesperia thaumas* (*linea*), five males; *H. comma*, one male. In the same locality I took *Eubolia mensuraria* (*limitata*), *E. bipunctaria*, and *Carpocapsa grossana*, the last beaten out of beech. One *Vanessa io* was seen in our garden in the summer. Can anyone suggest a reason for the apparent rarity of this species in more than one locality during the last three or four years?—PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*January 21st*, 1903.—The Seventieth Annual Meeting. The Rev. Canon Fowler, M.A., D.Sc., President, in the chair. After an abstract of the Treasurer's accounts, showing a satisfactory balance in the Society's favour, had been read by the Auditor, Mr. H. Goss, one of the Secretaries, read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1903–1904:—President, Professor Edward B. Poulton, M.A., D.Sc., F.R.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and Mr. Henry Rowland-Brown, M.A.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of Council, Colonel Charles T. Bingham, F.Z.S.; Mr. Malcolm Burr, B.A., F.L.S.; Dr. Thomas A. Chapman, F.Z.S.; Mr. Arthur John Chitty, M.A.; Mr. Hamilton H. C. J. Druce, F.Z.S.; the Rev. Canon Fowler, M.A., D.Sc., F.L.S.; Professor Raphael Meldola, F.R.S.; Professor Louis Compton Miall, F.R.S.; the Rev. Francis D. Morice, M.A.; Dr. David Sharp, M.A., F.R.S.; Colonel Charles Swinhoe, M.A., F.L.S.; and Colonel John W. Yerbury, R.A., F.Z.S. It was announced that Professor Poulton, the new President, would appoint the Rev. Dr. Fowler, Professor Meldola, F.R.S., and Dr. D. Sharp, F.R.S., as Vice-Presidents for the Session 1903–1904. Canon Fowler, the retiring President, in the first part of his Address, dealt chiefly with the many facts that have been recently brought forward with regard to Cryptic Coloration and Mimicry, more especially as affecting the Order Coleoptera; the facts are indisputable, but the hypotheses founded upon them are, perhaps, sometimes pressed too far. In the second part the question of the origin of the Coleoptera was discussed:

there is no satisfactory evidence of the appearance of the Order in the Palæozoic period, but the leading families are found in the Lias, as completely differentiated as at the present time; in fact, many of the genera and even the species are almost identical with those now living; the Coleoptera, that is to say, have altered but little from the time at which they existed side by side with the gigantic extinct Saurians and the Pterodactyles; the whole question of the origin and history of the insects generally is of the first importance in the history of evolution. A vote of thanks to the President was proposed by Professor Poulton, and seconded by Professor Meldola. The President replied. A vote of thanks to the Officers was proposed by Professor Meldola, and seconded by Mr. C. O. Waterhouse. Mr. McLachlan, Mr. Goss, and Mr. Rowland-Brown replied.—H. Goss, *Hon. Sec.*

South London Entomological and Natural History Society.—*November 27th*, 1902.—Mr. F. Noad Clark, President, in the chair.—Mr. E. J. Hare, East Dulwich Grove, S.E., was elected a member. The meeting was devoted to a special exhibition of notable captures and varieties, and was, as usual, a very successful gathering. Between eighty and ninety members and their friends attended, and a large number of exhibits were made.—Messrs. Harrison and Main exhibited very varied series of several species of Lepidoptera recently taken in the Shetland Isles, including *Eupithecia nanata*, *Dianthœcia nana* (*conspersa*), smoky and dark forms; *Noctua festiva* var. *conflua*, and *Anarta melanopa*, with normal types for comparison.—Mr. Cant, a pair of the extremely dark form of *Hemerophila abruptaria*, taken this year in Regent's Park.—Mr. Kaye, long series of *Anchocelis lunosa*, with the forms *obsoleta*, *humilis*, *brunnea*, *neurodes*, and *agrotoides*; see Brit. Noct. ii. 168–170. He had not met with var. *rufa*, which was said to be common.—Mr. R. Adkin, examples and series of hybrid Lepidoptera, and read notes on their life-history: (1) *Smerinthus ocellata* ♂ × *Amorpha* (*Smerinthus*) *populi* ♀; (2) *Selenia bilunaria* (*illunaria*) ♂ × *Selenia tetralunaria* (*illustraria*) ♀; (3) *Pygœra pigra* (*reclusa*) ♂ × *P. curtula* ♀; and (4) *P. curtula* ♂ × *P. pigra* ♀. In the two last series the female influence was dominant; in the two former cases the characters of male and female were pretty evenly shared or deleted.—Mr. Carpenter, specimens of *Apatura iris* bred from larvæ he had hybernated, and on behalf of Mr. Oldaker: (1) *Lycæna* (*Polyommatus*) *icarus*, a gynandromorph, left side male, right side female, taken June 14th, 1902. (2) a male with under side having faint marginal spots, and only one spot on central area of ashy grey, taken June 7th; both were from Ranmore Common. (3) a male about the size of an average *Lycæna* (*Cupido*) *minima*. And (4) a var. of *Vanessa* (*Euvanessa*) *antiopa*, bred from German larvæ, with no blue spots on upper wings and only one blue spot on the lower wings.—Mr. Scollick, an example of *Vanessa* (*Aglais*) *urticæ*, with ground colour resembling that of *Vanessa* (*Eugonia*) *polychloros*, and a *Plusia chrysitis*, with the usually burnished appearance greatly curtailed on one side.—Mr. Hare, a *Strenia clathrata*, with nearly the whole of the lighter markings of the type obliterated, taken at Marlborough; and an *Ephippiphora obscurana* (*gallicolana*), with the dorsal blotch suffused with fuscus.—Mr. J. A. Clark, an almost white var. of *Agrotis suffusa*, taken in September in South Devon, and two hybrid *S. ocellata* ♂ × *S. populi* ♀.—Mr. Lucas, several examples of the dragonfly, *Oxygastra curtisii*, from Hants, with nymph-skins from France; and several specimens of the earwig, *Labidura riparia*, from Bournemouth. On behalf of Mr. Ansorge, a series of *Agriopis aprilina*, bred from the New Forest, and having very dark lower wings.—Mr. G. T. Porritt, the Huddersfield range of forms of *Polia chi*, from almost white to dark slate, including the forms *olivacea* and *suffusa*.—Mr. Joy, aberrations of *Aphantopus* (*Epinephele*) *hyperanthus*, from Folkestone, mainly showing a tendency to diminution of the eye-spots.—Mr. Main, on behalf of Mr. Mera, a series of very dark *Odontopera bidentata*, bred from Leeds; and a brilliant green example of *Mimas* (*Smerinthus*) *tiliæ*, bred in the London district.—Mr. Turner, three forms of *Melanippe montanata* taken at Amersham, Bucks, in June: (1) all the marking obsolete or very faint, except a costal blotch; (2) asymmetrical, with the lower half of central band on left fore wing very narrow; (3) a light form, showing a darker marginal shade to all the wings. Mr. Russel, a *Pyrameis cardui* having apex of fore wings much shortened, with marking much compressed, but in perfect symmetry, taken at Margate. —Mr. Hamm, a photograph of a *Papilio machaon*, bred from Wicken, with asymmetrical wings and markings; hind wings were elongated and antennæ shorter. A large amount of irregular black suffusion was present on all four wings.—Mr. Edwards, a case exhibiting some of the extreme forms of Satyridæ as shown in the genera *Hetera*, *Citheronia*, *Pierella*, and *Antirrhœa*.—Mr. Henderson, series of *Xanthia* (*Citria*) *fulvago* (*cerago*) and *Eupithecia tenuiata*, bred from sallow catkins in Surrey, and a well-marked series of *E. rectangulata* from Berkshire.—Mr. Rayward, pupæ of *Papilio machaon*, showing assimilation in colour to their surroundings.—Dr. Chapman: (1) forms of *Cœnonympha pamphilus* from France, Italy, Switzerland, Norway, and Spain, illustrating the variation in marginal colouring, development of ocelli, ground colour, and general markings, with the extreme form *lyllus*; (2) *Lycæna* (*Polyommatus*) *corydon*, Swiss forms, *corydonius* from Spain, and two forms of *hispana* from Spain; (3) *Erebia stygne* var. *bejarensis*, large and more richly coloured; (4) *Lycæna* (*Plebeius*) *argus* var. *bejarensis*, much larger and more brilliantly marked and coloured, suggesting that *argus* (*ægon*), *zaphyrus*, and *lycidas* are local forms of one species.—Mr. Tonge: (1) *Strenia clathrata*, black var. from Andover; (2) *Phyllocnistis suffusella*, a fine bred series from Reigate; (3) *Lithocolletis quercifoliella*, bred from oak and beech; (4) *L. clerkella*, dark and some nearly black, with suffused markings, bred from cocoons found on cherry by Dr. Chapman.—Mr. Harrison, on behalf of Mr. C. P. Pickett, a large number of aberrations of British Lycænidæ, *Mimas* (*Smerinthus*) *tiliæ* and *Angeronia prunaria*.

December 11*th*.—The President in the chair.—Mr. Cowham, of Stoke Newington, was elected a member.—Mr. South exhibited, for Mr. Arkle, of Chester: (1) *Ematurga atomaria* female, having the ground colour unusually white, and the markings much intensified, with a wide submarginal black band on all four wings; (2) a series of *Cœnonympha typhon*, from Delamere Forest. The specimens, which were of the *rothlebii* form, showed considerable variation in size, number, and shape of the ocelli on both surfaces, and also in the amount of white marking on the under side of the hind wings. In two examples the ocelli were oval in shape, and their outer edges projected. In another specimen the ocelli on the under side of the hind wings were large, especially the two nearest anal angle. The white markings of a fourth specimen were unusually developed, and consisted of a broad irregular-edged transverse band reduced to a slender line between veins 2 and 4, an elongate patch at the base below the costa, and a curved and tapered streak beneath the discoidal cell extending to the band. (3) A melanic example of *Cymatophora duplaris*; (4) *Thera variata*, having the central band nearly black, and the rest of the wing of a light brown; (5) a melanic *Agrotis exclamationis*.—Mr. Ashdown specimens of the Homopteron *Ledra aurita*, taken at Mickleham together with larvæ from the New Forest. Mr. Turner recorded the species from Chattenden Woods, and Mr. West from West Wickham. —Mr. R. Adkin, a specimen of *Euchloë cardamines*, having the discoidal spot reduced to a mere speck.—Mr. Goulton, an example of *Catocala nupta* from Balham, showing a general darkening in colour. Dr. Chapman, cocoons of *Nudaria murina* and *Euchromia lethe*, showing the larval hairs similarly made use of, but with different effects, owing to the cocoon in one case being slight, while in the other it was dense; and the hairs in the former few and long, while in the latter they were short and abundant.—Mr. Turner, a pair of a large *Tarantula* sp.? from Trinidad, together with a species of *Automeris* from the same place.—Mr. Kirkaldy gave an account of a tour he had recently made in Italy and Switzerland, illustrating his remarks with a large number of photographs.—Hy. J. Turner, *Hon. Report Sec.*

Birmingham Entomological Society.—*November 17th*, 1902.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. R. C. Bradley showed a series of *Panurgus ursinus*, taken at Barmouth this summer; also specimens of *Catabomba pyrastri* and *selenitica*, one each from Barmouth, in which the usual colouration of the pale markings on the abdomen was reversed, those of *pyrastri* being yellow, and those of *selenitica* white; also var. *unicolor* of *pyrastri*, from Moseley. Mr. Wainwright suggested that the colours of the spots had been affected in the killing by sulphur, &c., but Mr. Bradley thought not.—Mr. A. H. Martineau showed various insects:—*Vanessa polychloros* from Budleigh Salterton, South Devon, and *Melanargia galatea* from Sidmouth; also *Cerceris arenaria* from Budleigh, together with its weevil prey, which was captured with it; and *Tabanus autumnalis*, which was taken in the house at Budleigh. Mr. Wainwright said he had several times seen Tabani indoors.—Mr. A. D. Imms, *Erythromma naias*, from Yardley Wood, a species of dragonfly which seems to be local and not common in this country, but which Mr. Bradley has already made known from one local place, Sutton Park; also *Sympetrum striolatum*, taken in his own garden at Moseley.—Mr. G. T. Bethune-Baker, a long series of *Ematurga atomaria*, from the hills above Curwen, which showed much variation in the shape of the wings, in markings and coloration; some of the females closely approximated to the colour and pattern of the males. It was remarked that all alike were pale in comparison with our local ones, especially contrasting with Cannock examples. Some were so pale that on the wing they looked quite white.—Colbran J. Wainwright, *Hon. Sec.*

EXCHANGE.

Duplicates. — Conspicillaris* (1, type), Illustraria,* Rhizolitha (6), Ægon, Cinxia* (6), Autumnaria* (6), Dominula (2), Munda (2), Aurinia (4), Glandifera, Cytisaria (3), Aprilina* (6), Galatea, Pennaria.*—*Harris Doidge; The Elms, Sherford, Taunton.*

Duplicates. — Chrysorrhœa,* Flavocincta, Promissa, Umbratica, Griseola (white pins), Pennaria (males), Erosaria, Vitalbata,* Plumaria (males), Illunaria* (white pins), Parthenias (white pins), Punctulata, Abbreviata, Leucophæaria (males, white pins), Cinxia* (white pins). In good condition and on black pins, except where otherwise stated; also a very few Stramineola, Deplana, Complana, Undulanus, Miniata, B. Quercus, Coryli, Cinctaria (males), and Taminata; some on white, some on black pins. *Desiderata.*—Clearwings, Pygmæola, Fascelina, B. Trifolii, Flavicinctata, Salicata, Sagittata, Cucullina, Carmelita, Alni, Menyanthidis, Myricæ, Turca, Graminis, Cespitis, Obelisca, Præcox, Leucographa, Rubiginea, Croceago, Gilvago, Ochroleuca, Lutulenta, Nigra, Lichenea, Herbida, Occulta, Tincta, Glauca, and many other Noctuæ. Data on both sides.—*F. M. B. Carr; The Choir School, The Close, Salisbury.*

Duplicates.—Rhizolitha, Variata,* Polychloros,* Paphia, Aprilina, Sibylla,* T. Quercus,* Macilenta, Rufina, Monacha,* Fimbria,* Gothica, Cervinata,* Lucipara,* Lithorhiza, Valesina (fair), Pennaria* (males). *Desiderata.*—Numerous. —*L. F. Hill;* 2, *Freelands Road, Bromley, Kent.*

Duplicates. — Chrysidiformis.* *Desiderata.* — Pruni and Clearwings only.— *J. P. Barrett; St. John's Villas, Margate.*

Duplicates.—Advenaria* (3), Lichenaria,* Obscurata,* Liturata* (4), Omicronaria,* Cytisaria, Illustraria,* Auroraria, Hirtaria,* Betularia* (3, black form), Alni,* Rumicis,* Rhomboidea,* Verbasci,* Sulphuralis, Euscula. *Desiderata.*— Paniscus, Scoliæformis, Plantaginis, P. Populi, Parallelaria, Lunaria, Viduaria, Alternata, Carbonaria, Sagittata, Griseata, Bicuspis, Fagi, Cassinea, Nubeculosa, Crenata, Plumigera, Algæ, A. Ligustri, Auricoma, Menyanthidis, Agathina, Ochroleuca, Albimacula, Gnaphalii, Orichalcea, Bractea, Mi, Irregularis.—*J. Miller;* 44, *Longfield Street, Merton Road, Wandsworth, London, S.W.*

Duplicates.—Machaon,* Rhamni, Adippe, Egeria, Davus, Corydon, Pygmæola (a few), Caniola (fair), Neustria, Maculata, Fasciaria (fair), Extersaria, Punctulata, Candidata, Exanthemaria, Piniaria, Juniperata,* Variata, Subtristata, Munitata, Tersata, Signata, Bipunctaria, Perla, Nictitans and var. Erythrostigma, Ambigua, Suffusa, Saucia, Rubricosa, Rufina, Cerago,* Gilvago, and many others; black pins. *Desiderata.*—Globulariæ, Dodonæa, Turca, Fibrosa, Flexula, and others; also pupæ.—*A. H. Shepherd;* 81, *Corinne Road, Tufnell Park, London, N.*

Duplicates.—Adonis (8), Euphrosyne (6), Artemis (4, white pins), Vinula* (3), Potatoria (4), Caia (2), Salicis (8), Chrysorrhœa (6), Lubricipeda var. Radiata (2), Aprilina (6), Oxyacanthæ (6), Protea (6), Miniosa (a few, fair), Mi (4), Gracilis (2), Brunnea* (2), Suffusa (4), Strigilis (1 dark form), Leucophæaria (5), Nigrofasciaria (2). Most of the above are in good condition. *Desiderata.*—Athalia, Artaxerxes, Paniscus, Sinapis, Cassiope, Davus, Pruni, Betulæ; also many Noctuæ and Geometers. Type specimens of these will do, and condition does not matter, if not too bad.—*H. B. Philby; St. Peter's College, Westminster, S.W.*

Duplicates.—Adippe (fine), Valezina (1), Iris (4 types), Ianira vars., Quercus,* Betulæ,* Lucina, Comma, Lineola, Actæon, Convolvuli (3), Velleda (2), Quadra,* Castrensis* (female), Versicolor (3), Or, Orion, Sublustris (2), Ambigua (2), Fimbria,* Croceago (4), Xerampelina (1), Pyralina (3, fair), Carpophaga (2), Sphinx (4), Solidaginis, Exoleta, Moneta* (2), Promissa, Sponsa, Autumnaria,* Syringaria,* Glabraria,* Pictaria (3), Undulata,* and others. *Desiderata.*—Athalia (undersides), Apiformis, Sesidæ, Globulariæ, Chlorana, Muscerda, Liturella, Cratægi, Bifida, Dictæa, Octogesima, Alni, Ligustri, Straminea, Flammea, Nonagriæ, Scolopacina, Reticulata, Connexa, Ophiogramma, Leucostigma, Captiuncula, Ripæ, Agathina, Præcox, Obscura, Ravida, Ashworthii, Depuncta, Rubiginea, Subtusa, Pulveraria, Oo, Irregularis, Xanthomela, Templi, Atriplicis, Conspicillaris, Fusifera, Nubeculosa, Lychnitis, Chryson, Bractea, Cracca, Comitaria, Obfuscaria, Blomeri, Sylvata, Holosericata, Degeneraria, Similata, Salicata, Unangulata, Cucullata, Fluviata, Rufata.—*B. W. Adkin; Brandon House, Morden Hill, Lewisham, S.E.*

Duplicates.—Pupæ of Populi. Betularia, Tiliæ, Vinula, and Pudibunda. *Desiderata.*—Numerous. Pupæ of Porcellus and Elpenor especially wanted.—*F. E. Boddington; 44, Allen Road, Northampton.*

Duplicates.—Hispidus, Muralis (S. Devon), Ambigua. *Desiderata.*—Globulariæ, Cannæ, Rufa, Nana, Brevilinea, Atriplicis, Dictæa, Craccæ, Cæsia, Auricoma, Pruni, &c.—*E. A. Cookayne;* 59, *St. Giles, Oxford.*

Victoria History of the Counties of England.—Bedfordshire.—Lists of, and Notes on, any Order of Insecta collected or observed in the county of Bedford will be gratefully received by H. Goss, The Avenue, Surbiton Hill, Surrey.

Changes of Address.—F. M. B. Carr, *from* 46, Handen Road, Lee, S.E., *to* The Choir School, The Close, Salisbury. G. Harold Conquest, *from* 58, Hatherley Road, Walthamstow; *to* The Moorings, Meteor Road, Westcliff-on-Sea.

MEETINGS OF SOCIETIES.

Entomological Society of London (11, Chandos Street, Cavendish Square W.).—Wednesday, February 4th, 1903, at 8 p.m. Papers to be read:—1. "An Account of a Collection of Rhopalocera made on the Anambara Creek in Nigeria, West Africa," by Percy I. Lathy, F.E.S. 2. "On the Hypsid Genus Deilemera, Hübner," by Colonel Charles Swinhoe, M.A., F.L.S., F.Z.S.

South London Entomological and Natural History Society (Hibernia Chambers, London Bridge, S.E.).—Meetings on the 2nd and 4th Thursdays in each month at 8 p.m.

City of London Entomological and Natural History Society.—The meetings of this Society (held at the London Institution, Finsbury Circus, E.C.) will take place on the 1st and 3rd *Tuesdays* in each month, from 7.30 to 10 p.m.

Nonpareil Entomological and Natural History Society (17, Rahere St., Goswell Road, E.C.).—Meeting nights, 1st and 3rd Thursdays in each month.

North London Natural History Society.—Meetings are held on the 1st and 3rd Thursdays in each month at the Sigdon Road Board School (close to Hackney Downs Station, G.E.R.), at 7.45 p.m. The eleventh Annual Exhibition will be held at the Sigdon Road Board School (Girls' Department), February 21st. The Meeting commences at 7 o'clock p.m. Tickets can be had of any of the members, or of the Secretary, E. W. Lane, Parkholme, Fletching Road, Clapton, N.E.

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THE ENTOMOLOGIST

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THE EARLIER STAGES OF *LYCÆNA ARION.*

By F. W. Frohawk, M.B.O.U., F.E.S.

Since my last notes on the earlier stages of *Lycæna arion*, published in the 'Entomologist,' vol. xxxii. p. 104 (May, 1899), I have been yearly endeavouring to solve the mystery which still surrounds the last stages of the larva. Before dealing with the slight advances I have gained concerning its economy, I will describe the larva in its first stage, which I omitted doing in my previous notes, so that the descriptions of its first four stages may be complete.

The larva, directly after emergence, is exceedingly small, measuring only $\frac{1}{32}$ in. long; it is rather stout in proportion; the segmental divisions are deeply defined, and with a longitudinal dorsal furrow; on the first segment is a large dorsal darkly coloured disk, and a smaller one on the anal segment. The colour of the body is pale ochreous yellow, tinged with greenish; on the dorsal surface are longitudinal rows of glassy white serrated hairs, placed in two pairs on each side of each segment above the spiracles, the dorsal row all curve backwards, the anterior one on each segment is much the longest, and all have pedestal-like bases of an olive colour, the subdorsal pair are both short, the anterior one curving forwards, the posterior one backwards; below the spiracle, which is black, are three brownish-coloured serrated hairs placed in a triangle, all project laterally, l have dark bases; the central one is very long; below these, the first lateral lobe of each segment, is a single simple white ir, and two other similar ones on the base of each clasper. e head is of a shining olive-black. The whole surface of the dy is densely sprinkled with blackish points, giving it a rough pearance, and adding to the appearance of the depth of the segmental divisions; the legs and claspers are similar in colour to the body.

From observations I made last year concerning the deposition of the eggs in a natural state, I felt convinced that some connection existed between *arion* larvæ and the common yellow ant (*Formica flava*) by the preference shown by the butterfly in selecting the thyme growing on ant-hills for oviposition. Therefore, the following extracts from my note-book may be of interest, as they throw some light on the habits of both *arion* larvæ and of the ants.

From July 5th to 17th inclusive found *L. arion* numerous. During this period I watched several females depositing, and on the last day saw four laying their eggs on thyme-blossom on the top of a hill; the thyme grew in patches among the short turf (and on the ant-hills), which was composed of the usual small plants which clothe the surface of the Cornish downs, and with a few furze-bushes dotted about; but the plants selected were those growing in the open, and some distance from the furze-bushes, therefore fully exposed to wind and rain. Under every patch of thyme visited by the female butterflies I found ants' nests. I also saw other females deposit on the thyme growing on ant-hills, and also on the thyme upon the turf-walls, where ants are likewise in abundance. Several captured females deposited on plants potted up during the last three weeks of July. On Aug. 8th I had larvæ in four different stages, some only just hatched, one over the third moult, and others fixed for third moult, a large number after first and second moults; after moulting they ate part, and in some cases nearly all, the cast skins.

On July 29th I found two of the larvæ rolling about together under the thyme blossom; upon close examination I found the smaller one had seized the larger with its jaws, which were buried into its side, apparently sucking it. Upon pulling them apart I placed the victim under the microscope, and found a deep hole in its side, with the surrounding surface shrunken, and liquid exuding from the wound. This conclusively proves the cannibalistic habits of these larvæ, which I had always suspected, as on previous occasions large numbers of larvæ had disappeared in a mysterious manner. I then placed about fifty larvæ on as many sprigs of thyme, so as to keep them separate and under very close observation.

On Aug. 11th, many having passed their third moult, when they cease feeding on thyme, I started investigating what relation there might be between the larvæ and ants, thinking in all probability that they might feed either on the larvæ or pupæ of the latter. I at first selected one of the larvæ after the second moult to experiment with, as I found that after the third moult they do not attack each other; so that their cannibalistic habits only exist during the first three stages. I supplied this larva with an ant's cocoon with one end removed; it at once began eating it. I then placed them under the low power of the microscope to carefully watch the proceedings, which were interesting. I watched it feeding on the jelly-like substance of the pupa, as well as the cocoon, which it ate in the same manner as it would a leaf, by biting the edge. It fed for several minutes. This seemed so far satisfactory, as I thought I had found the right food for the larvæ in their subsequent stages, but this proved not to be the case. Having found a dead *arion* larva, I placed it in a box with some ants, which immediately seized hold of it, apparently intending to kill it. I then put a live larva in another box with four ants (*F. flava*), and expected them to treat it in the same way, but was surprised to find them act quite the reverse; they all immediately ran to it, and, waving their antennæ over and upon it, at the same time closed their jaws, and then apparently smelt and licked it, and seemed particularly attracted to the hinder part of its back, about the tenth segment. First one and then another of the ants would would run over the larva, and then stop to lick that part of its back. I then noticed a tiny bead of moisture appear, and one of the ants touched it with its mouth, which instantly caused the bead to disappear. I afterwards placed both larva and ants under the microscope, which at once revealed the cause of attraction, for there on the tenth segment I found a small elongated transverse gland on the dorsal surface. I then examined with the microscope another larva in the same stage while it was feeding, during which operation the gland is kept throbbing; so I placed the ants close to it, and soon saw them run over it (of course, under the microscope only a foot or part of an ant would appear in the field). Directly a foot touched the gland, or very near it, it immediately throbbed more violently, and swelled up. It then ejected a globule of clear-white liquid. At the same instant the head of an ant appeared, and licked up the drop. In a few seconds a foot again touched the gland, and another bead of liquid oozed out, which was at once again licked up by an ant. An interesting fact is that the larva unheeded the ants running over and around it while it kept feeding; but the gland is apparently extremely sensitive to the touch of an ant's foot. Although I have several times touched the glands of several larvæ with the point of a very fine sable-hair brush, they would at once wince and contract, but on no account could I induce the exudation of the liquid; but directly an ant's foot, or the claws of the foot, touched it a bead would appear, and at once be imbibed by the ants. Although the larva was kept in a box with numerous ants, both workers and winged females, together with their pupæ, the ants one and all acted precisely similarly; not one attempted to bite the larva, but as soon as they touched it they slowly closed their jaws, and waved their antennæ over and upon it.

The gland is of peculiar construction, being formed of flexible tissue, and surrounded by numerous glassy white pyriform processes varying in size; some are extremely minute; those bordering the edges of the gland are furnished with excessively small white bristles, each process bearing four or five; these are in the form of a fan with diverging points, and all are directed towards the central aperture, the whole forming a fringe surrounding the gland, and are obviously for the purpose of holding the bead of liquid in place, and probably also serve as a protection to this apparently sensitive organ.

The larvæ appear to be perfectly at home with the ants, as neither molest each other. In this stage (after third moult), I have been unable to perceive any attempt at cannibalism among the larvæ, although, as I have pointed out, this habit exists in the earlier stages.

As I have alluded in these notes to the larva *feeding* during the fourth stage, I may mention that I discovered, after trying over three dozen different plants, a certain food upon which I induced them to feed for many weeks, during which time they slowly grew from ⅛ to ¼ in. in length.

February, 1908.

SPECIES OF THE GENERA *EMMELESIA* AND *EUPITHECIA* TAKEN IN ROXBURGHSHIRE.

By W. Renton.

Emmelesia affinitata.—Not very common. I have taken it near Hawick, Minto Woods, Wells Woods, Kelso, and St. Boswell's; and have found larvæ feeding on the seeds of red campion near Jedburgh, August.

E. alchemillata.—Generally abundant throughout the county; the larvæ feeding on the seeds of the stinging nettle (*Urtica urens*), August and September.

E. albulata.—Common where it occurs. I have found it by beating hedgerows; also on grass-banks, woods, and moors. In the locality of Hawick, Jedburgh, Kelso, &c. Taken the larvæ feeding on seeds of yellow rattle, July and August.

E. decolorata.—More or less common over the county in July. Collected larva from red campion in August.

E. unifasciata.—Much less common than the two last preceding species. I have taken the imago resting on wire fences on Kirton Moor, Bellion Moor, in July. The larva is unknown to me.

E. minorata (*ericetata*).—Very common on moors and pasture ground all over the county. This larva is also unknown to me. It is said to feed on heath; I have, however, found the imago on grass-ground two to four miles from heath.

Eupithecia venosata.—Rare and local; near Hawick and Minto Woods, in June and July. I have never bred this species, but always took specimens in the locality of campions.

E. pulchellata.—One near St. Boswell's, June 5th, 1901.

E. subfulvata.—Common in general over the county, resting on palings and stone walls. Larvæ common in May and June on yarrow and milfoil. The imago is on the wing in August and September.

E. plumbeolata. — Rare in the Duke Woods, near Hawick, and Muirfield Moss, June and July.

E. pygmæata.—Common in general where *Urtica urens* grows, in hedgerows, woods, &c. The larvæ feed on the seeds, July, August, and September.

E. helveticaria.—Common on junipers, Fallside Moor, June. Larva August and September.

E. satyrata.—Very common all over the county, June and July.

E. castigata.—Another common species in general over the county July.

E. trisignaria.—Common near Hawick, resting on stone walls, disused quarries, and rocks on moors, June and July. I have taken the larva on wild angelica in August. I never took this species anywhere except in the neighbourhood of Hawick.

E. fraxinata.—Rare on the banks of the Teviot from Hawick to Kelso, June. Larva unknown to me.

E. indigata.—Common in all the Scotch-fir woods, June and July. Second brood in September.

E. nanata.—Another common species on moors from May to August.

E. vulgata.—Common outside of woods from May to July. In general over the county; bred this species from willow.

E. minutata.—A rather common species on Kirton Moor, near the Fox Cover, the only locality in which I have taken it; June and July.

E. assimilata.—Common in gardens throughout the summer. I have reared the imago from larvæ collected on black currant and gooseberry.

E. tenuiata.—Local in Wells Woods and Minto Woods, July; taken the larvæ from sallow catkins, April.

E. lariciata.—More or less common in woods, June and July.

E. abbreviata.—Common some seasons at sallows, April and May. I have bred this species from blackthorn.

E. exiguata.—Common generally among thorn, May, June, and July. Larvæ on whitethorn in August.

E. sobrinata.—Larva common on junipers, Fallside Moor, June. I have bred them from blackthorn when my food-plant got too dry and old. This species is variable.

E. togata.—Very local and rare in fir-woods, Hawick, Kelso, and Jedburgh, in June, on the trunks or palings around the wood.

E. coronata.—Rare in Wells Woods, June. This is the only locality where I have taken the species in Roxburghshire.

E. rectangulata.—Local in gardens and hedgerows, June and July. Collected larvæ in May from apple-blossom.

Deanbrae, Hawick.

DESCRIPTIONS OF SOME NEW SPECIES OF CLYTHRIDÆ (PHYTOPHAGOUS COLEOPTERA).

By Martin Jacoby.

The following species, which are contained in my collection, and for the greater part belonging to the genus *Melitonoma*, I am unable to refer to any of those described by Lacordaire or since. The species are very difficult to separate, of nearly uniform colouration, and very variable, so that structural differences are the only reliable guard with the position of the elytral spots in connection.

Melitonoma terminata, sp. n.

Black; thorax fulvous, extremely finely and closely punctured, the base with a black band; elytra more distinctly and very closely punctured, fulvous, a spot on the shoulders, two placed transversely at the middle, a transverse band near the apex, and the apical margins black.

Var.—Thorax entirely fulvous. Length, 6 mill.

Hab. Bar el Salaam, East Africa.

Of cylindrical shape; the head black, impunctate, the vertex convex, the lower portion finely strigose, anterior margin of the clypeus nearly straight, labrum black; antennæ extending to the base of the thorax, black, the lower three joints fulvous; thorax strongly transverse, narrowed at the sides, the latter rounded, as well as the posterior angles, the surface extremely closely and finely punctured throughout, the basal margin rather broadly produced at the middle, the disc fulvous, the base with a transverse black band, which sends off upwards at each side a short branch; scutellum black; elytra extremely closely and more strongly punctured than the thorax, fulvous, the shoulders with one, the middle with two spots placed transversely, another transverse band below the middle, the margins of which are strongly sinuate, and the extreme apex of each elytron black; under side and legs black, or the tibiæ and tarsi fulvous.

I possess two specimens of this species, which differ in regard to the presence or absence of the thoracic band and the colour of the legs, but in no other way; the closely and finely punctured thorax and the apical black elytral spots will separate this species from any other of the genus.

Melitonoma capitata, sp. n.

Fulvous; the breast, abdomen, and the femora black; head and thorax impunctate, epistome nearly straight anteriorly; elytra very finely punctured, with the usual five black spots (1, 2, 2). Length, 6 mill.

Hab. Delagoa Bay.

It will only be necessary to point out that this species differs from any of its allies (*M. epistomalis*, Lac., excepted) in the entirely fulvous head, and in the nearly straight anterior margin of the epistome, but more specially in the sides of the head, which are prolonged subquadrately below the eyes; the thorax does not differ from other species of the genus, being narrowed at the sides, and the surface is unspotted; the elytral punctuation is very fine, nearly obsolete at the apex, and partly arranged in irregular rows; the tibiæ and tarsi are fulvous.

I possess a single apparently female specimen, which was obtained by the late Mrs. Monteiro.

MELITONOMA BOMAENSIS, sp. n.

Bluish black below; the tibiæ and tarsi flavous; head black; thorax flavous, impunctate, with two lateral and one central black spot; elytra closely and distinctly punctured, flavous, each with five spots (1, 2, 2), the last two obliquely placed. Length, 6 mill.

Hab. Boma (Congo); Angola, Delagoa Bay, Sierra Leone.

Head black, impunctate, finely pubescent between the eyes, the clypeus feebly semicircularly emarginate anteriorly; antennæ black, the lower four joints fulvous; thorax strongly transverse, the sides greatly deflexed, nearly straight but slightly narrowed, the disc entirely impunctate; flavous, with a basal subquadrate spot at each side, and another small intermediate spot; scutellum black, pointed, with a slight central ridge; elytra feebly lobed at the sides, subcylindrical, rather strongly and closely punctured, the punctures arranged in very irregular rows; a spot on the shoulders, two others at the middle, placed transversely in a line, and two below the middle, the outer one of which is placed lower than the other, black; below and the femora bluish black, the tibiæ and tarsi flavous.

The position of the posterior spots, which is nearer the apex than in most other allied species of the genus, and their oblique direction, as well as the colour of the tibiæ and tarsi, distinguish this species, of which I have six specimens before me. Also collection H. Clavareau.

MELITONOMA PUNCTIPENNIS, sp. n.

Bluish black; the head finely pubescent; thorax fulvous, impunctate, with five black spots; elytra very strongly punctured, fulvous; a spot on the shoulders, a transverse band at the middle, and another near the apex, blue-black. Length, 6 mill.

Hab. Niger, Benué Exped. (Staudinger).

Head black, shining, impunctate, the vertex convex, lower portion pubescent; eyes large; antennæ not extending to the base of the thorax, black, the second and third joints obscure fulvous; thorax twice as broad as long, very slightly narrowed in front, the disc convex, entirely impunctate, flavous, the base with a subquadrate black spot at each side; the disc with three other small spots placed triangularly between the larger ones; scutellum black, pointed; elytra feebly lobed at the sides, strongly and closely punctured in irregular rows; the shoulders with a rather large round spot, the middle with a transverse medially narrowed band, and followed by another one near the apex, the second band with the posterior margin deeply concave, neither of them extending to the sutural and lateral margins; under side and legs black.

Of this species I have only a single female specimen before me, but the strong punctuation of the elytra differs so much from any of its allies that it cannot be mistaken for any other species. *Clythra notata*, Klug, resembles the present insect greatly, but is of larger size; the head is differently coloured, the thorax of different shape and markings, and the elytral bands likewise differ, as well as the sculpture.

(To be continued.)

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

By Dr. H. J. Hansen.

(Continued from p. 44.)

The posterior tibiæ in a more typical Jassine—for example, a *Tettigonia* or *Idiocerus*—are, as is well known, *quadricarinate*, and also more or less conspicuously *compressed* (or at least never depressed), so that the posterior* surface is narrower than the surfaces on both sides, and, in every case, than the *anterior* surface; moreover, at least, the two margins which limit the posterior surface are endowed with several or many spines. A similar structure is found in the fine Australian genus *Eurymela*, Hoffmansegg, which in consequence of its entire structure may well stay in the neighbourhood of the Bythoscopine group. The genus *Paropia*, Germ., which is ranged by Sahlberg as a somewhat aberrant group even beyond *Ulopa*, by Kirschbaum and Fieber as representing a peculiar family, seems to me to *be a very good Jassine* in the structure of posterior tibiæ, the cheeks, antennæ, &c.; to lay great stress on excavations on the frons and vertex appears to me extremely absurd. *Paropia* ought, it seems to me, to stand, judging from its whole structure, in the neighbourhood of the Bythoscopini. The interesting genus *Ledra*, F., seems, at a first glance, to diverge strongly from the other Jassinæ by the remarkable head, the often two-flapped pronotum, and the cultrate posterior tibiæ; it is on this account signalized by Fieber as representing a family, by Sahlberg (*l. c.* p. 103) as forming a transition to the Membracinæ, "to which it is by some authors referred," a supposition entirely without good grounds. In the forms akin to *Ledra*, such as *Petalocera bohemanni*, Stål, *Epiclines planata*, F., and *Proranus adspersipennis*, Stål, the posterior tibiæ are quadricarinate, compressed, and the posterior margins spinose, the latter being especially notable in the last-named form; the cultrate form occurring in *Ledra* is only a strong compression, so that the outer surface has disappeared as such. The cheeks (*genæ*) are in *Ledra aurita*, L., somewhat expanded, in *Petalocera* and many of the related forms —*Tituria*, Stål, *Titia*, Stål, *Sichæa*, Stål, *Rubria*, Stål (according to Stål's statement in Hem. Afr.)—"very slightly dilated"; and the last-named genus seems to lead over to *Xerophlœa*, Germ., which is a good Jassine with somewhat expanded cheeks. The antennæ in *Ledra aurita* are also (see above) formed as in the Jassinæ, and by no means resemble the antennæ in that Membracine-form, in whose neighbourhood *Ledra* should probably stay, viz. *Æthalion*, Latr. *Ulopa* diverges, on the contrary (see later on), essentially from Jassinæ, and must pass over to Membracinæ, but after the removal of this genus the Jassinæ in the above-given circuit seem to me to be a very natural division—a "Subfamily," *characterized by the more or less dilated cheeks, the typical quadricarinate, compressed* (sometimes cultrate) *posterior tibiæ* (and the slender antennal whip, which, however, is not an exclusive character).

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* The nomenclature of various surfaces here and later on is not always strictly in accordance with the original. Any alteration is either initiated or endorsed by the author.—G. W. K.

The remaining part of the family Jassidæ may perchance be comprised as one division, Membracinæ. It is, as regards the structure of the head, antennæ, and posterior legs, far more multifarious than the Jassinæ; one can scarcely find positive characters for it as a whole, and it ought perhaps, as proposed by Stål, to be separated into several groups equivalent with Jassinæ; but most of these groups will probably not coincide with Stål's "Subfamilies."

A character probably met with in all the forms, and binding them together, can be expressed thus: "*cheeks scarcely or not at all dilated.*" A group of the Membracinæ—the "Hoplophorida," Stål—is characterized by the arranger (Hem. Afr. p. 82), "posterior tarsi small, shorter than the anterior pair"; but it is not quite so sharply expressed as it could be, as their posterior tarsi are in reality *far thinner* and *nearly double* as short as, for example, the intermediate tarsi; and besides, this character is not exclusive, for I am acquainted with forms, which certainly in every way are referable to the subfamily "Membracida," Stål, in which the posterior tarsi are clearly shorter and more slender than the other pairs, to almost as great a degree as in the "Hoplophorida." On the other hand, the group certainly shows always a character peculiar to it, *viz.* the posterior tibiæ are for the greatest part of their length *considerably compressed obliquely, and towards the apex curved first of all inwards and then again outwards.* In the above-mentioned Membracis-forms with the short posterior tarsi, the tibiæ are curved somewhat backwards at the apex, but they do not resemble those in the Hoplophorini, being besides to a high degree *depressed*, not compressed. The presence of this interesting *oblique* compression in the little group (the Hoplophorini) renders it impossible for me to refer the form of their structure to the plan which presumably is expressed in the shape of the posterior tibiæ in all remaining Membracinæ. If one examines the posterior tibiæ—for example, in *Ulopa*, Fall., *Æthalion*, Latr., *Centrotus*, F., *Darnis*, F., *Smilia*, Germ., and very many important genera—it is seen that they are tricarinate, most often sharply tricarinate, with strong bristles on the margins, and that the *posterior surface is always broad*, scarcely ever narrower, most often broader than the other surfaces, so that the posterior tibiæ never display a tendency towards compression, as in Jassinæ, but contrariwise are often somewhat *depressed;* only in *Polyglypta*, Burm., have I found them almost round, the edges being strongly rounded off. In the group "Membracida," Stål, and various genera of "Centrotida," Stål, the depressing is, as is well known, so far carried on that the tibiæ are foliaceous. In various species of the genus *Aconophora*, Fairm., in *Heteronotus*, Lap., and many forms, the tibiæ have a tendency to become quadricarinate, so that on the anterior side one finds two *subcontiguous* rows of small spines or bristles, but they are clearly depressed,* and *the posterior surface is very broad and altogether dominant.* It may be objected that this characterization lacks sharpness, but it seems obvious to me, nevertheless, that, despite all secondary changes, essential differences are typically found in the structure of the posterior legs in the Jassinæ and Membracinæ in the circumscription of these here set forth.

In the Hem. Afr. pp. 82–83, Stål separates his first five subfamilies from the "Centrotida" by "Scutellum absent or obsolete, not extended beyond the metanotum," in opposition to the fact in Centrotida: "Scutellum distinct, produced backwards beyond the metanotum." In the first place, this character is wrongly expressed, because if one removes the pronotal posterior lobe—for example, in *Smilia*—one finds a good-sized scutellum, and one can therefore only state to what degree the scutellum is hidden or visible; in the second place, the other part of the character is not correct, for Stål himself writes on the Centrotid genus *Oeda*, Am. and Serv., in 'Hemiptera Fabriciana,' p. 49, "no complete scutellum," in contradistinction to "scutellum complete, produced"—for example, in *Stegaspis*, Germ,; thirdly, the character may well be practically useful, but effects, in my opinion, an artificial, not a natural, separation; for genera like *Hypsauchenia*, Germ., and *Lycoderes*, Germ., stand far nearer, in my opinion, by the structure of the legs and antennæ, to *Membracis*, F., and *Pterygia*, Lap., than to *Centrotus*, not to mention *Oeda*, Am. and Serv., *Bocydium*, Latr., *Tolania*, and other Centrotid genera. My opinion is thus that the group Centrotida, Stål, may be rejected, and the genera with strongly dilated tibiæ referred to "Membracida," Stål, which group then becomes very natural, and can, indeed, be redivided according to the structure of the face, *i.e.* whether this be widened to a prominent sharply margined plate, both at the sides and downwards (as in *Membracis*, F., *Bolbonota*, Am. and Serv., *Pterygia*, Lap.), or only dilated at the sides (*Oxyrhachis*, Germ., *Lycoderes*, Germ.). How to separate the other types of the division Membracinæ, mihi (after the removal of "Hoplophorida" and "Membracida," in the new sense proposed by me), I dare not attempt, but simply state that they may best be discerpted into some smaller groups; only I must say that I am certain that *Æthalion* ought to rest in the neighbourhood of *Centrotus-Tolania* (*cfr.* Stål), which also it approaches by the antennal structure (see p. 39).* Next ought perhaps *Ulopa*, according to the structure of head and antennæ, to form a small division by itself near the *Centrotus* group; Stål, in 1858, placed it in Membracina, but in 1866, certainly, removed it to Jassida.

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* In the original, "sammentrykte" is a misprint, so the author informs me, for "fladtrykte."—G. W. K.

(To be continued.)

NOTES AND OBSERVATIONS.

New Forest Natural History Society.—We learn from a circular received from the hon. secretary—Mr. G. Morris, of Brockenhurst, Hants—that a Natural History Society bearing the above title has been established. Although the subscription is very small, the scheme of operations seems to be distinctly large. Among other useful work that the Society proposes to undertake, "as soon as funds permit," is that of publishing "a Monthly Report and District Floral and Faunal Guide, for the benefit of members and correspondents." Although the Society will discourage the possible exterminator of rare plants, insects, &c., it will always be prepared to furnish non-resident members who may visit the district with information as to localities and times of appearance of such rarities as they may wish to obtain, and so save their valuable time.

Vanessa io, ab. cyanosticta.—I am more and more convinced of the value and convenience of varietal names, especially in the case of the Diurni and the more conspicuous species amongst the Macro-Lepidoptera generally. I have therefore much pleasure in bestowing the name of *cyanosticta* on that form of *Vanessa io* in which a single blue spot (varying considerably in size) is found beneath the "peacock eye" on the hind wing. It does not seem to be mentioned in any of the text-books to which I have access, but is well known to a good many collectors and is not of very rare occurrence. I bred about half-a-dozen specimens from a single batch of larvæ found here last season.—(Rev.) Gilbert H. Raynor; Hazeleigh Rectory, Maldon, Feb. 20th, 1903.

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* Vol. xxxiii., p. 119, of translation.—G. W. K.

Kestrel Destroying Butterflies.—I have been asked by my friend Mr. Bankes, of Corfe Castle, to send you a note of a habit of the kestrel which has on several occasions fallen under my notice. On the 18th July, 1901, I was in company with my brother, Mr. E. Harker Curtis, on the top of Ballard Down, Swanage, catching butterflies. The species noticed were mostly *Melanargia galatea*, *Argynnis aglaia*, *Hipparchia semele*, *H. tithonus*, and *H. janira*. Whilst thus engaged, a kestrel (*Falco tinnunculus*) was observed hawking about and hovering over the long grass, every once now and then dropping like a stone to the ground, remaining a second or two and then rising again. These movements attracted my attention, so my brother and I lay down in the grass to watch the bird. After some time I remarked to my brother that the bird did not seem to get much, as it never rose with a mouse or a lizard, and it certainly did not remain on the ground long enough to eat either. Presently the bird dropped close to a furze bush, and I crept up to the bush and looked over the top. The kestrel jumped and flew off, leaving a half-eaten *Argynnis aglaia* on the ground. Then I followed the bird and examined the places where it went down, and found almost every time either the mutilated remains of a *M. galatea* or of an *A. aglaia*. It seemed to have least difficulty in catching *galatea*, as, finding what it was doing, I watched it very closely and saw it miss several of the wily *aglaia*. The bird waited until the insect pitched, and then pounced down on it, and, having regard to the fact that the females were busy depositing ova, the percentage of the females killed must have been very large. I found by counting that the bird caught about thirty-six specimens in an hour, and it was hard at it for at least five hours, that is to say, the whole time I was present; and when I left, the bird was still hawking about. I have seen a kestrel at the same place on many occasions since, and similarly occupied. The bird certainly did not seem to bother itself about me, as I could have captured it in my net had I been so disposed, since it allowed me to approach within a couple of yards or so. Mr. Henry Seebohm, in his 'History of British Birds' (vol. i. p. 48), mentions frogs, moles, mice, caterpillars, lizards, earthworms, cockchafers, grasshoppers, and locusts as its usual foods. Mr. R. Bowdler Sharpe also makes statements to the same effect.—W. Parkinson Curtis.

Urticating Effects of Larvæ Hairs.—The irritating properties contained in the hairy coats of most of the Bombyces are well known and sometimes painfully remembered by a good many collectors, possessed, like myself, with a susceptible cuticle. The cocoons have for me a particularly uncomfortable manner with them, but not until this past season did I detect a fairly clearly defined difference in the effect produced by different species. It was while examining some cocoons of *Porthesia auriflua* that I inadvertently rubbed my forearm with the fabric; almost immediately the crimson inflammation appeared, together with excessive itching, and continued for some three hours without cessation, after which arose small red pimples, changing on the second day to white vesicles, which, after discharging a watery fluid, left an appearance as of eczema. I determined to put the matter to a further test, and, a week or two after, subjected my arm to a similar dose, with precisely similar results. Eucalyptus oil afforded relief from the smarting of the discharging vesicles, but nothing that I could find would allay the first irritation, common washing soda affording the nearest approach to relief. During the season I tried the effects of various other Bombyces, with the following results: two applications, each having similar results, were tried in each case, except *Macrothylacia rubi*. *Arctia caia*: No subsequent complication after first irritation, which lasted about half an hour and was almost immediately susceptible to common soda. *A. villica:* Similar to *A. caia*, but the hairs on the larvæ lacked the irritative properties possessed by the commoner species. *Lasiocampa* (*Bombyx*) *quercus:* Primary irritation very pronounced, but not so lasting as in the case of *P. auriflua;* the pimples changed to vesicles towards the end of the day, and by morning were dry scabs, the irritation and smarting being slight compared with that produced by the "gold tail." *Malacosoma* (*Bombyx*) *neustria:* The red inflamed patch gave much trouble, and the irritation was great, but no pimples resulted; common soda quickly reduced the itching. *Macrothylacia* (*Bombyx*) *rubi:* I decided after the first experiment not to continue operations with this species. Some of the fabric got into my eyes, and for three days I endured much discomfort; the eyes watered and became inflamed, and much difficulty was experienced in opening the lids in the morning; some of the vesicles on the arm assumed the appearance of pustules, and it was quite a week before I got rid of the effects; the primary itching was excessive and continued for ten or twelve hours, the application of various "palliatives" being useless; common soda relieved temporarily. *Callimorphia dominula*: I sacrificed most of my pupæ experimenting with these species, but beyond a slight irritation from the hairs of one partially changed larva, no material effects were experienced. *Gastropacha* (*Lasiocampa*) *quercifolia*, *Saturnia carpini*, and *Orygia antiqua* gave no special results, but *Dasychira pudibunda* produced red patches and vesicles as in the case of *P. auriflua*, the vesicles, which were similar in appearance to those produced by the disease known as chicken-pox only much smaller, discharged on the second day and left an irritating smarting which eucalyptus oil only partially allayed; the primary itching, however, was not susceptible to either soda, potass, or borax. I was not able to procure cocoons of *P. chrysorrhœa*, but have not any doubt that the effects would have been similar to those produced by *P. auriflua*. The last-named, therefore, with *M. rubi* and *D. pudibunda*, prove to be possessed of the most irritating properties both as to larval coat and cocoon fabric. It may be that my cuticle is more susceptible than that of others, but I would like to know if any of these experiences agree with the effect produced by the same means upon others of your readers. I may mention that in most cases a piece of common washing soda, wetted and rubbed upon the surface of the irritated part until the deposit dried, was usually the most effective palliative, while eucalyptus oil was generally successful in easing the smarting after the discharge of the vesicles.—Wm. A. Carter; Burr Villas, Bexley Heath.

Porthesia chrysorrhœa in England. — With reference to Prof. Meldola's note (*ante*, p. 17), I beg to say that I have not hurriedly jumped to a conclusion with regard to Continental supply as he suggests. As a matter of fact, I have made a careful study of this insect in its haunts around the south-east coast for the last four years, from the egg state to the imago, being on the ground almost continually during the whole time, and I can safely say that we have had five "good years," during which time it has spread very rapidly, and I am not at all surprised, although pleased to hear, that it has reached as far as Wales. Now, as this insect was very plentiful about thirty years ago, and then suddenly disappeared entirely, it is very evident that after so many years' absence a fresh supply must have come from somewhere, and it is certainly very significant that it should turn up again at two or three places where direct steamers are running to and from the Continent, *viz*. Newhaven, Dover, Folkestone, and Harwich. There are at least two causes likely to bring about extermination —parasites and starvation. At Newhaven, immediately near the steamers' loading berths, this is pretty clearly shown, where the hedges on either side of the road for over a quarter of a mile present an extraordinary sight when the larvæ are nearly and some full grown, not a vestige of foliage remaining. The larvæ are everywhere, on the paths, fences, posts, and in the roadway, wandering about in search of food, and there is no doubt large numbers die from starvation, while others perish from the attacks of a fly (not a true ichneumon), very like a house fly, which "stings" the young larvæ soon after they leave the egg. When rearing hybernating larvæ, I have noticed that those that are stung wake up first and feed up much quicker, and the consequence at Newhaven is that those that are full fed when the food-plant gives out are the larvæ that are stung, and the half-fed, non-infected, larvæ no doubt perish in large numbers from lack of food. I have proved this by bringing the larvæ away in the nests when young, and also when nearly full-fed, and carrying them through to the imago stage. Notwithstanding the above, I saw hundreds of nests there a few weeks ago, and there were no signs of their diminishing. I should say that *P. chrysorrhœa* was very plentiful at Brighton, Eastbourne, Deal, and Margate, but the numbers are nothing like those at Newhaven, which reminds one of a great distributing depôt, the larvæ being easily traced along the railway hedges in the direction of London, and along the coast eastward, over Beachy Head, through Eastbourne, Pevensey, and Hastings, and westward through Rottingdean, Brighton, and Shoreham; and there is no doubt in my mind that we get considerable additions from the Continent of *chrysorrhœa*, besides other insects that come to light, and which are taken in the neighbourhood of Newhaven.—C. W. Colthrup; 127, Barry Road, East Dulwich, Jan. 20th, 1908.

Sympetrum fonscolombii in the Act of Migrating. — Mr. L. E. Adams has forwarded to me a male specimen of *Sympetrum fonscolombii*, which, apparently, he was fortunate enough to observe in the act of migrating. He says: "I enclose a specimen of a dragonfly that I brought from Ghenitshesk, in the Azov, this summer (*i. e.* 1902). While at anchor there, two miles off shore, we were infested with multitudes of gnats, and these were followed by a corresponding multitude of these dragonflies (all the same species), which rapidly thinned the gnats." Those interested in British dragonflies will recollect that Mr. C. A. Briggs and his brother a few years ago met with the species (evidently immigrants and all males) at Wisley ponds, in Surrey. It is not really a British dragonfly. Mr. McLachlan has been good enough to look at the insect which has not assumed its mature ruby colouring. —W. J. **Lucas**; Kingston-on-Thames.

Larvæ of British Coleophora.—As I wish to record the life-history of all the species of the genus *Coleophora*, I should be greatly obliged if entomologists would kindly send me any cases and living larvæ which they may meet with and have to spare. I shall be most happy to do what I can in return.—Hy. J. **Turner**; 13, Drakefell Road, St. Catherine's Park, Hatcham, S.E.

CAPTURES AND FIELD REPORTS.

Agrotis ripæ at Chester.—I took a fresh and perfect specimen of this species on the night of August 18th—insects were generally delayed as to date, last season, by the cold summer—at one of the electric lamps nearest the river. Its identity was kindly established for me by Mr. C. G. Barrett. I believe this is the first record of the moth from Chester, and the interest attaching to the capture is the fact that we are twenty miles in a straight line from the coast. Stretches of sand certainly occur, midway down the river, but they are swept by the tides.—J. **Arkle**; January, 1903. Since writing the above I find the food-plants of the species *Cynoglossum officinale* (houndstongue) and *Salsola kali* (saltwort) are to be found six miles down the river, away from Chester; the first on the Shotwick Marshes, and the second on the Dee banks. These observations appear to throw a light on the distances traversed by moths before some of them reach our electric lamps, many of which are high up above the surrounding country.—J. **Arkle**; 2, George Street, Chester, Jan. 9th, 1903.

Sirex gigas in Wales.—An example of this hymenopteron, which from appearances seemed to have only recently emerged, was caught resting on the window-sill of the kitchen window of our house, on June 24th, 1901, by my sister Agnes Shelley, who thinking so strange a fly might possibly be of interest to me, secured it by placing a net over it.—**Thomas J. Shelley**; 103, King's Road, Canton, Cardiff, Glamorganshire, Jan. 20th, 1903.

Hawk-moth Pupating on Surface of Ground.—In October, 1902, through a miscalculation, I disturbed some of the larvæ of *Sphinx ligustri* that had gone down to pupate; one of these, when unearthed, refused to remain in the earth a second time, and changed on the surface. The pupa at first was of a greenish colour, very similar to the colour of the larva itself. The colour then slowly changed to a yellowish green, and then again to a reddish hue. This last tint grew darker in colour, until the pupa had attained the ordinary aspect of the chrysalis of *S. ligustri*. The change occupied about five days altogether.—Thomas J. Shelley; 103, King's Road, Canton, Cardiff, Glamorganshire, Jan. 20th, 1903.

Captures at Wimborne, October, 1902.—While on a visit to Wimborne, in October last, I sugared a few trees near the house where I was staying, on four consecutive evenings (7th to 10th), and captured the following eleven species:—*Agrotis suffusa*, *Noctua c-nigrum*, *Anchocelis rufina*, *A. pistacina*, *A. litura*, *Scopelosoma satellitia*, *Xanthia ferruginea* (*circellaris*), *Epunda nigra*, *Phlogophora meticulosa*, *Hadena protea*, and *Xylina ornithopus* (*rhizolitha*). The two last-named species were also taken from tree-trunks in the daytime.—Philip J. Barraud; Bushey Heath, Herts.

Butterflies in the Maidstone District, 1902.—The following notes may perhaps be of some interest, giving as they do a list of the Rhopalocera to be found in this locality, and taken by myself last season (1902) within a radius of six miles around Maidstone. Considering the inclemency of the weather and poor results of other collectors, I think it a very satisfactory one:—*Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Colias hyale* (one freshly emerged specimen, June 9th); *C. edusa* (Sept. 6th), *Gonepteryx rhamni*, common; *Argynnis aglaia*, common (July 10th, Aug. 9th); *A. adippe* (Aug. 21st), common; *A. euphrosyne*, *Vanessa polychloros*, two (Aug. 9th); *V. io*, *V. urticæ*, *V. atalanta*, *V. cardui*, *Melanargia galatea*, common (Aug. 9th); *Pararge megæra*, *Satyrus semele*, common (Aug. 3rd, Sept. 6th); *Epinephele ianira*, *E. tithonus*, *E. hyperanthus*, *Cœnonympha pamphilus*, *Thecla quercus*, *T. rubi*, *Chrysophanus phlæas*, *Lycæna astrarche*, common; *L.* (*Cupido*) *minima*, *L. ægon*, fairly common (July 13th, Aug. 3rd); *L. argiolus*, *L. corydon*, common (Aug. 3rd, 20th); *L. bellargus*, *L. icarus*, *Hesperia malvæ*, *Thanaos tages*, *Adopæa comma* (Sept. 6th); *A. sylvanus*, *A. thaumas*. It was very noticeable how late many of the species were in making their appearance.—Arthur J. Golding; Lower Fant, Maidstone.

Collecting in Ross-shire, 1902.—Last year (Entom. xxxv. 145) I recorded some of my captures in an out-of-the-way part of Ross-shire, at the head of the River Carron, and now add a few more notes about my collecting at the same place in 1902. *Lasiocampa* (*Bombyx*) *callunæ* was the most interesting species. The larvæ were in great numbers, feeding on the heather, and in places upon sallow and other plants, but I had no success in rearing them in captivity.

On Aug. 9th about one hundred larvæ were sent home to Emsworth, and other lots were sent at the beginning of September. These were kept under the most natural conditions and not crowded, yet only about two per cent. attained the pupa state. The same thing happened with those which I tried to rear on the spot in Ross-shire; nearly all died.

About Sept. 11th I first noticed a good many dead larvæ hanging to the heather-stalks on the moor, showing that even in the wild state the death-rate among them was very high.

On Sept. 23rd I began to find the cocoons on the moor. Upon tussocks of grass or lumps of moss or lichen a brown web would be noticed, and under this, embedded in the moss, &c., was the cocoon. Of these cocoons I found about fifty or sixty before the middle of October, but I spent very little time looking for them, and no doubt hundreds might have been found by careful searching in suitable places. No young or newly hatched larvæ were observed in the autumn of 1902. On the other hand, in the autumn of 1901 I saw no full-grown or year-old larvæ, but I did see a good many young ones, about a month or two old. These observations point to the species appearing only biennially and not every year. The insect in this cold country appears to spend quite fourteen months in the larva state.

The extreme lateness of insects in 1902 was very noticeable. *Larentia cæsiata*, *L. didymata*, and *Cidaria populata* were all observed from Sept. 20th to 27th, and not in bad condition either. A female specimen of *L. cæsiata* was taken, in fair condition, on Oct. 9th. *Cœnonympha davus* was also very late in 1902, while in Sutherlandshire, during August up to the 24th of that month, I noticed three or four in good condition every day, and on the 19th I took a pair *in cop.*

Returning again to my collecting in Ross-shire on the Carron water. One specimen of *Crymodes exulis* was taken at sugar on Aug. 8th; the specimen is in good condition; it resembles the form known as *assimilis*, Doubl., that I have seen from the Rannoch district, and is quite different, especially in its smaller size, from the Shetland form. I am not aware of this species having been recorded from Ross-shire before.

Sugaring at this time (beginning of August) was not at all successful, and only produced a few specimens of *Xylophasia rurea*, *X. monoglypha*, *Apamea gemina*, *Hadena adusta*, *Noctua rubi*, *N. festiva*, &c. The weather was cold, wet, and windy.—W. M. Christy; Watergate, Emsworth, Hants.

Notes from Wales.—Among other captures in this district during 1902 I took about twenty-five larvæ of *Dasychira fascelina*. They all pupated, and I had the pleasure of seeing sixteen emerge between July 18th and 30th. This insect appears in great profusion here some years, though its numbers vary greatly. Is it generally becoming scarcer? for I seldom see accounts of its capture, and I think it was not mentioned in the 'Entomologist' last year. Another insect which is fairly regular in its appearance here is *Chærocampa porcellus*. On Oct. 4th, last year, I took a newly emerged specimen of *Grapta c-album* in some woods near here. Is not this a rather late appearance for this species? My last record of the same insect here is Sept. 1st, 1897, when a friend of mine and myself took a pair within five yards of each other, in the same clearing as my last capture.—Thos. H. Court; Llandudno College, Llandudno, Feb. 9th, 1903.

Collecting in the New Forest.—The summer (if such it may be called) of 1902 will long be remembered by entomologists as one of the most unsatisfactory and unproductive seasons in their experience. But notwithstanding the prevailing depression there are, no doubt, bright spots to be looked back to, and I, for one, have very pleasant recollections of a highly enjoyable, and by no means unprofitable, fortnight spent in the New Forest with two of my brothers. Not having visited this favourite hunting-ground since 1898, it was with great satisfaction that I once more journeyed to the old familiar haunts. Having on previous occasions made Brockenhurst our centre, we determined to settle at Lyndhurst, and arrived at that charming village on July 10th, after an uneventful journey, with the exception of the discovery, on our arrival, that a tin of treacle had broken loose in transit, and rambled round my brother's portmanteau, with effects which can be better imagined than described. Thus began our sugaring. We lost no time in getting to work, and on the evening of our arrival started out with a large acetylene lamp of seventy-candle power, which we used most of the evenings during our stay. Unfortunately, nearly the whole of the time we were troubled by that enemy of entomologists—the moon, so that it was only on two or three evenings that light had at all a fair chance. We soon found things were rather backward, and that there was little to be got in the way of imagines in the thickly wooded parts of the forest; for after netting good series of *Argynnis paphia* (including one or two var. *valesina*), *Limenitis sibylla*, and *Melanthia albicillata*, there was very little besides. Consequently, nearly the whole of our time was devoted to working the swamps and heaths, with the result that a different class of insects was obtained to those taken on our previous visits.

Like most tourists this year, we cannot give the weather very high credentials. The first three or four days of our stay were magnificent, and St. Swithin's day being the last of these, we felt there was hope of the good weather continuing. But, alas for the old tradition. St. Swithin proved to be a very worthless sort of dignitary, as the next day was pelting wet, and this was followed, during the rest of our visit, by dull and at times rainy days, succeeded by cold clear moonlight nights, about as unfavourable for light and sugar as well could be. Hard work, however, produced good results, the following insects being taken in the swamps by day:—*Argynnis adippe*, *Zygæna trifolii*, very abundant, and yielding some good pale and confluent forms. *Euthemonia russula*, most active; we met with it before sunrise, at all hours of the day, and it came dashing around our lamp at night. Both males and females were taken, and from the latter several batches of ova were obtained. *Drepana falcula* was occasionally noticed, and *Hydrelia uncula* flew in fair numbers when the sun shone, as also an occasional *Hyria muricata*. On the 14th we got up before sunrise and sallied out to seek this insect at its natural time of flight, but without success, and we came to the conclusion that it was not yet out. This proved to be the case, as by adopting similar tactics near Brockenhurst, on the 25th, we each obtained a long and variable series of this beautiful little insect, one of my prime favourites. It flew briskly among bog-myrtle, commencing its flight precisely at six, and continuing on the wing about three-quarters of an hour, after which it was very difficult to find a single specimen. By tapping the trunks of saplings and trees of small growth we obtained *Erastria fuscula*, *Cleora glabraria*, *Minoa murinata*, *Eucosmia undulata*, *Eupisteria heparata* (in numbers), *Ephyra orbicularia* (one only, very worn), and both sexes of *Bupalus piniaria*. *Acidalia immutata* was also noticed in the swamps, and more frequently by day than by night. Day-work on the heaths produced *Lycæna ægon*, *Anarta myrtilli*, *Euclidia glyphica*, *Gnophos obscurata*, *Selidosema ericetaria*, *Acidalia straminata*, and *Aspilates strigillaria*. Several specimens of *Heliothis dipsacea* were seen on the 14th, but not captured.

Sugar proved to be almost entirely a blank in the thicker parts of the forest, the only insects taken being *Nola strigula*, *Dipterygia scabriuscula*, and *Gonophora derasa*. We succeeded better in the swamps by sugaring a post and rail-fence, and took the following:—*Thyatira batis*, *Gonophora derasa*, *Acronycta leporina*, *A. ligustri*, *Leucania impudens* (extremely abundant), *L. impura*, *Rusina tenebrosa*, *Agrotis strigula*, *Noctua festiva*, *Euplexia lucipara*, *Aplecta nebulosa*, *Hadena contigua*, *Gonoptera libatrix*, and *Mania maura*.

Network at dusk proved to be by far the most profitable method. We fell in with *Nudaria senex* in good numbers, but its flight was greatly affected by climatic conditions. On the 14th the weather was perfect for it, and it appeared in hundreds at early dusk, and again, later on, at light; other insects were *Lithosia mesomella* (in abundance), *Hepialus hectus*, *Lithosia quadra* (one specimen on our last evening), *Cymatophora duplaris*, *Thyatira batis*, *Erastria fuscula*, *Boarmia roboraria*, *Phorodesma bajularia*, *Lobophora sexalata* and *Collix sparsata* (both in plenty round the sallows at night), *Eucosmia undulata*, *Iodis lactearia*, *Pseudoterpna pruinata*, *Melanthia albicillata*, *M. rubiginata*, *Ligdia adustata*, *Eupisteria heparata*, and *Cidaria dotata*.

On the one or two evenings towards the close of our stay, when the moon was obscured by clouds, light was very profitable, and in one evening about 150 specimens were taken at the lamp. These included *Euthemonia russula*, *Lithosia mesomella*, *Calligenia miniata*, *Nudaria senex*, *Phalera bucephala*, *Odonestis potatoria*, *Malacosoma neustria*, *Nola strigula*, *N. cucullatella*, *Leucania impudens*, *L. impura*, *Agrotis strigula*, *Acidalia emarginata*, *A. scutulata*, *A. straminata*, *Epione apiciaria*, *Ourapteryx sambucaria*, *Tephrosia crepuscularia*, *Cleora lichenaria*, and *Geometra papilionaria*. This beautiful insect looked most graceful, as it came with sailing flight to the lamp. It flew about 11 p.m., but when disturbed earlier in the evening its movements were so lightning-like that it was impossible to capture it. *Lobophora sexalata* again put in an appearance, while *Hypsipetes elutata* and its congener *impluviata* were both very abundant, and yielded some good forms: *Lomaspilis marginata* (very variable), *Hemithea strigata*, *Boarmia repandata* and *gemmaria*, *Larentia pectinitaria*, *Melanthia albicillata* (one), *Pachycnemia hippocastanaria*, and *Rivula sericealis*. On this occasion we were up all night, being out with the lamp until about 2 a.m., and then (after a good supper and an examination of our catch) going to Brockenhurst for *Hyria muricata*. On the 21st we went on pilgrimage, to renew our acquaintance with the shrine of *Hesperia actæon* at Swanage, and, notwithstanding a very dull day, we each obtained a fair series, but the specimens were somewhat worn, and the species was evidently getting over. *Melanargia galatea* was also common on the cliffs, and several specimens of *Cledeobia angustalis* were taken, We cycled to Ringwood one evening, on the chance of a belated *Emydia cribrum*. In this we were unsuccessful, but were rewarded by each obtaining a good series of *Pachycnemia hippocastanaria*. On the road between Lyndhurst and Ringwood we encountered Mr. J. H. Fowler, who very kindly placed two hours at our disposal, to look at his magnificent series of *E. cribrum* vars. of *Callimorpha dominula*, and other interesting insects.

We did but little larva-beating or searching, but the following were noticed:—*Peridea trepida*, *Notodonta camelina*, *Psilura monacha*, *Euchelia jacobææ*, *Macrothylacia* (*Bombyx*) *rubi*, *Tæniocampa stabilis*, *Plusia gamma*, *Tephrosia consonaria*, *Iodis lactearia*, and (at Swanage) *Nonagria typhæ*.

We left on the 26th, with many regrets, having had a most enjoyable hard-working holiday.—Hugh J. Vinall; 3, Priory Terrace, Lewes.

SOCIETIES.

Lancashire and Cheshire Entomological Society.—By the courtesy of the Warrington Corporation the usual monthly meeting was held in the Museum, Warrington, on December 8th, Mr. William Webster, of St. Helen's, in the chair. Messrs. J. F. Dutton (Helsby) and J. R. le B. Tomlin (Chester) were duly elected members of the Society.—Mr. Alfred J. Jolley read an instructive paper on "Larval Forms, a Study for the Doctrine of Descent," in which he portrayed the magnitude of the difficulties with which the student had to contend, and the need for caution in dealing with questions of evolution in those animals that passed through complete metamorphoses, since in many cases the life-history of the individual cannot be accepted as representing the life-history of the race. A hearty vote of thanks having been accorded the lecturer for his interesting and exhaustive discourse, Mr. F. N. Pierce contributed a communication "On the Specific Differences between *Lithosia sericea*, *L. complana*, and *L. complanula*," in which he recorded the results of his investigation on the genitalia of the Lithosidæ. Unfortunately, the results of his research as regards the first two were of a negative character, inasmuch as the genitalia were identical in both species; but as *L. pygmæola* was also similar to these, and no one doubted the claim of the latter to specific rank, he was of opinion that as the differences in colour, habitat, larvæ, &c., were so constant, until the one had been bred from eggs laid by the other, *L. sericea* and *L. complana* must stand as distinct species. The notes were illustrated by the author's preparations, thrown on the screen by the micro-lantern, drawings of the genitalia, and the insects themselves. Mr. Collins, in discussing the paper, confirmed Mr. Pierce's conjecture as to moisture being responsible for the production of melanism in the Lithosidæ. The following exhibits were examined:—A fine collection of Transvaal Lepidoptera, ranging from the Sphinges to the Deltoides, by Captain B. Fairclough; Lithosidæ, by Mr. F. N. Pierce; British Longicorns, including *Strangalia aurulenta*, *Saperda scalaris*, and *Leptura scutellata*, by Messrs. J. R. le B. Tomlin and J. F. Dutton; some remarkably light varieties of *Abraxas grossulariata* and *Thera firmata*, from Delamere, by Mr. J. Womersley; gall-making insects and specimens of their work, by Mr. J. Deane; melanic forms of *Triphæna orbona* from Lewis, Elgin, &c., one specimen with dark hind wings lacking the marginal band being exceptionally interesting, by Mr. B. H. Crabtree; *Caradrina ambigua*, *Aporophyla* (*Epunda*) *nigra*, &c.,

by Mr. R. Tait, jun.; *Vanessa urticæ*, varieties, by Mr. T. Wright; insects found in timber, by Mr. W. Mountford; Lepidoptera varieties, by Mr. B. Prince; British Bembidiidæ, by Mr. R. Wilding; and beautiful specimens of *Dasycampa rubiginea*, *Plusia moneta*, &c., by Mr. J. Collins.

Correction.—I regret that in the account of my exhibit at the Lancashire and Cheshire Entomological Society's October meeting Mr. W. H. Harwood's Colchester earwig should have been given as *Forficula pubescens* (Serv.) (Entom. xxxv. 331). It should have appeared *F. lesnei* (Fin.). The error was mine,—E. J. B. Sopp.

Tiffins' School Natural History Society.—We have received a Report of the proceedings of this Society for the year 1902. The Society is connected with Tiffins' Endowed Schools, Kingston-on-Thames, and is affiliated with the South-Eastern Union of Scientific Societies. The President is Mr. W. J. Lucas, B.A.; the Treasurer, Mr. C. J. Grist, M.A.; and the Hon. Secretary, R. H. Carter. The business transacted during the year appears to have been extensive and varied. A number of lectures were delivered, and most of these were illustrated by photos and micro-photographs projected on the screen. Among the lectures was one on "Insects" by the President. Excursions were made during the season to various Surrey localities for the purpose of collecting and studying objects of Natural History, and it may be added that several of the members are greatly interested in Entomology.

RECENT LITERATURE.

L. Melichar. Monographie der Acanaloniiden und Flatiden (Homoptera). "Ann. Naturh. Hofmuseums Wien, Band xvi. pp. 178–258 (June 14th, 1902) and Band xvii. pp. 1–258 (1902). Plates i.–ix.

This goodly monograph of 334 pages completes the revision of the Pœkillopterinæ (sens. lat.), the "Ricaniiden" having been surveyed previously.* It is one of the most important Rhynchotal works that have appeared for some time, and students of that neglected order will be proportionately grateful to the author. I think, however, that an introduction, dealing with the salient points in the morphology of these insects and summarizing their geographical distribution and so forth, would have enhanced its value.

The "Acanaloniidæ"† are distinguished by the absence of cross nervures on the costal margin of the tegmina and of granules on the clavus; the posterior tibiæ are spineless. The "Flatidæ" (subf.) have cross nervures in the clearly marked-off costal membrane; the clavus is always more or less granulate, and the posterior tibiæ are furnished with one, two, or three spines each.

Six Acanaloniid genera are recognized, with 26 species; of these, 2 genera and 6 species are new. These 26 species are all American, with one exception—the African *Parathiscia conjugata*.

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* See 'Entomologist,' 1899, p. 263.

† Dr. Melichar unfortunately follows Lethierry and Severin in employing identical horismology for families and subfamilies, a very confusing practice.

Of the "Flatidæ," 85 genera are recorded, with 497 valid and 35 doubtful species; of these, 42 genera and 255 species are described as new. It may be noted that of these, 32 genera are erected with only a single species apiece; on the other hand, *Elidiptera* (= *Flatoides*) is credited with 91 and *Ormenis* with 77 species. The genera, as founded or confirmed by Melichar, appear to be well defined geographically. Roughly analysed, there are 25 genera confined to the Oriental Region,* 20 to the Æthiopian Region,† 11 to Central and South America and the Antilles, 7 to Australia and Polynesia, 6 to the Palæarctic Region,‡ 6 of mixed distribution or more or less cosmopolitan. Only 8 genera, with 17 species, have been described from Continental Australia, doubtless a small proportion. Of the 20 exclusively Æthiopian genera, 8 are confined to Madagascar.

While according every praise to the descriptions, analytical tables of genera and species, and to the excellent plates with figures of 179 species, I must take exception to certain details of Dr. Melichar's nomenclature. The principal mistakes or differences of opinion which I have noted are as follows:—

Band xvi.—P. 185. *Acanalonia umbraculata* (Fabr.) = *florea*, Stål. I know of no reason for sinking Fabricius' name. The date of "Vet. Akad. Verh. viii. p. 86," is, of course, 1869, not 1835.

P. 203. Stål was quite correct in erecting a new genus *Phromnia* for *floccosa* and its allies, the type of *Flata* having been fixed by Fabricius in 1803 as *ocellata*.

P. 218. *Cerynia*, Stål, K. Svenska Vetensk. Akad. Handl. iii. no. 6, p. 68 (1861).

P. 220. *Cerynia maria* var. *rosea*, Melich. 1902, = var. *rosea*, Atkinson, 1886, J. Asiat. Soc. Bengal, lv. pt. 2, p. 64; from Sikkim.

P. 222. *Cenestra*, Stål, K. Svenska Vetensk. Akad. Handl. iii. no. 6, p. 68 (1861).

P. 223. *Paramelicharia* n. n = *Copsyrna*, Melichar (nec Stål typ.). Type *maculata* (Guér.).

P. 224. *Copsyrna*, Stål, K. Svenska Vet. Akad. iii. no. 6, p. 69, = *Bythopsyrna* Melich. Type *tineoides* (Oliv.).

Melichar fixes the type of *Copsyrna* as *maculata*. Unfortunately, six months previously I had fixed it as *tineoides* (Oliv.), the other original species, the only one I was acquainted with. My paper in the J. Bombay Nat. Hist. Soc. was (p. 54) published Jan. 24, 1902; Melichar's Band xvi. June 17th, 1902.

P. 251. *Pseudoflata postica* (Spin. 1839) = *nigricornis*, Guér. 1843 (not 1838).

Band xvii.—P. 19. *Flata*, Fabr. typ. = *Cryptoflata*, Melichar (see my remarks on *Phromnia*).

P. 30. *Carthæa*; type *caudata*, Stål, Svensk. Vet. iii. p. 68, not *emortua*, as indicated by Melichar.

P. 32. *C. folium-ambulans* (de Geer) = *emortua* (Fabr.).

Pp. 33–4. *Ormenis mendax*, Mel., is stated to come from "Moupin," and Melichar adds, "Dieser Ort scheint in Centralafrika im Congogebiete zu liegen (Mupe)." Moupin, however, is well known through the researches of the late Père David,* and is one of the most interesting districts of the world, at a great elevation, on the other side of the Snowy Mountains of China (31° N., 101° E.), near Makin on the Yalong source of the Yang-tse-Kiang.

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* That is, including Japan, excluding New Guinea, &c.

† Including Madagascar.

‡ Excluding Japan, whose Fulgorid fauna seems to be more Oriental.

Pp. 58 & 107.—*Colgar*, Mel., is not equivalent to *Colgar*, Kirk. In founding this genus, I made it homotypical with the preoccupied genus *Atella*, Stål, stating the type to be *C. peracuta* (Walker). As this was one of Stål's original species (1866, Berlin. Ent. Zeit. p. 394), and as the genotype had not been fixed previously, my application of it cannot rightly be disputed. Walker's *peracuta* does not figure, however, in Melichar's idea of *Colgar*, but in his application of *Cromna*, Walker. *Cromna*, Walk., however, does not equal, in a restricted sense, *Cromna*, Mel., for the only species, originally included by Walker, is not found in Melichar's genus. The following synonymy will illuminate the puzzle:—

1. *Phyllyphanta*, Am. & Serv., 1843 = *Cromna*, Walker, 1857. Type of the former, *P. producta* (Spinola). Type of the latter, *C. acutipennis*, Walker.
2. *Colgar*, Kirk., 1900 = *Atella*, Stål., 1866 (preocc.) = *Cromna*, Melich., 1902. Type, *peracuta* (Walker).
3. *Neomelicharia*, n. *n*. = *Colgar*, Mel., 1902, nec Kirk., 1900. Type, *cruentata* (Fabr.).

P. 173.—*Elidiptera*, Spin., 1839 = *Flatoides*, 1843 = *Helicoptera*, Am. & Serv., 1843.

P. 173.—*Cerfennia*, Stål. (not *Cerfenia*). The original reference to Spinola's 1839 genera is Revue Zool. pp. 199–206.

The genus *Hansenia* should be credited to me (as it is in the index), and not to Melichar. My manuscript was sent in to the Bombay Nat. Hist. Soc. early in 1900 (not at the end of 1901, as printed), but was not published till January 24th, 1902. Melichar's monograph was issued subsequently to this. Melichar has, however, unfortunately followed my mistake of identifying the *Pœciloptera glauca* of Kirby with *P. pulverulenta* of Guérin. The two have nothing in common, and while the former is from Ceylon, the latter is from Mexico, and is rightly placed in *Ormenis* elsewhere in the monograph. The synonymy of *Hansenia glauca* will be as follows:—

Genus HANSENIA, Kirk., 1902, Journ. Bombay Soc. p. 58; Melich., 1902, Ann. Wien. Bd. xvi. pp. 195 & 228.

Type, *H. glauca* (Kirby).

Pœciloptera glauca, Kirby, 1891, J. L. S. xxiv. p. 154. *Hansenia pulverulenta*, Kirk., p. 54; Mel., p. 229 (nec *Pœciloptera pulverulenta*, Guérin).

These discrepancies are, however, comparatively slight, and the fact remains that for the first time we have lucid descriptions of all the species—except some of the Walkerian—of which about one-half are described as new. It is hoped that a considerable stimulus will thus be given to the study of these beautiful insects.

G. W. KIRKALDY.

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* I am indebted to Dr. Sharp for refreshing my memory on this point.

The Lepidoptera of the British Islands. By CHARLES G. BARRETT, F.E.S. Vol. VIII. 8vo. Pp. 1–431. London: Lovell Reeve & Co. 1902.

THE present volume concludes the Acidaliidæ and discusses nearly the whole of the genera in the Larentidæ. *Eupithecia*, *Eubolia*, *Mesotype*, and *Tanagra* still remain to be dealt with, and these will probably occupy half of the next volume.

That the Acidalids sadly need generic revision will be generally admitted, but our author has not attempted much in this direction. The adoption of *Ania*, Steph., for "*Acidalia*" *emarginata*, L., seems to be valid, but the employment of *Bradyepetes* for *amataria*, and of *Timandra* for *strigilata*, Hb., *emutaria*, Hb., and *imitaria*, Hb., is perhaps open to objection. *Amataria* (*amata*), L., is by most authors considered the type of *Timandra*, Dup. (1829) = *Bradyepetes*, Steph. (1831). The three species here referred to *Timandra* are included by Meyrick in *Leptomeris*, Hb., which Hampson merges in the Boarmid genus *Deilinia*, Hb.; while, to complicate things still further, Prout uses *Erastria* for *amataria*.

As in previous volumes, the remarks on habits, life-history, variation, and distribution are very complete, and these are matters with which the majority of those who are interested in the Lepidoptera of our own country are more immediately concerned, than with the ultraism of the newer entomology.

A Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne. By JOHN ROBSON, F.E.S. Pt. II. 8vo. Pp. 196–318. With Introduction, pp. i–xvi, and Title-pages to Pts. I. & II. London: Williams & Norgate. Newcastle-upon-Tyne: F. W. Dodsworth. December, 1902.

THE second Part of this excellent Catalogue, which treats of the "Geometrina," is in every way equal in merit to Part I., to which we had the pleasure of directing attention in 1899 (Entom. xxxii. 282). As we then observed, this is not simply a list of the species found in the area dealt with, but each entry is accompanied by useful notes; and in cases where doubt existed concerning the occurrence of species within the limits of the area, the author has very carefully investigated the matter, and retained or expunged such species according to the nature of the evidence obtained.

In the first part of the Catalogue the arrangement adopted by Barrett in 'Lepidoptera of the British Islands' was followed, but in the instalment before us the arrangement is that of Stainton's 'Manual.' This is certainly unfortunate, but should not lead to confusion.

We trust that the author may very shortly be able to publish the "Micro" portion of his work.

EXCHANGE.

Duplicates.—Variata, Lignata, Albulata, Vulgata, Plagiata, Pilosaria, Prunata,* Multistrigaria, Spartiata, Impluviata,* Cinxia,* Camelina, Hectus, Arcuosa, Festucæ, Anomala (3), Tritici, Fulva, Conigera, Litura, Geniculeus, Warringtonellus, Cembræ, Octomaculana. *Desiderata.*—Cordigera, Lychnitis, Gnaphalii, Scrophulariæ, Barrettii, Melanopa, Subtusa, Retusa, Pistacina, Leucographa, Sobrina, Pyrophila, Cinerea, Subsequa, Captinuncula, Leucophæa, Musculosa, Vitellina, Tridens, Leporina, Fluctuosa, Fuliginaria, Abietaria, Carbonaria, Carmelita, Cuculina, Sericea.—*A. M. Steuart;* 38, *Ferguslie, Paisley, N.B.*

Duplicates.—Paphia, Adippe, Euphrosyne (4), Rhami,* Io,* Hyperanthus (3), Tithonus (3), Vaccinii,* Rumicis, Stabilis,* Instabilis,* Gothica,* Orbona, Meticulosa, Margaritaria, Maculata (fair), Lactearia (3), Progemmaria, Auriflua,* S. Populi * (2), Litura, Pistacina. *Desiderata.*—Linea, Z. Trifolii, Loniceræ, Filipendulæ, Irrorella, Miniata, Castrensis, Fasciaria, Ornata, Promutata, Straminata, Inornata, Emarginata, Temerata, Clathrata, Citraria, Cæsiata, Eupithecia, Atrata, Pudorina, Lutosa, Anceps, Glyphica, Pulchrina, Lithoriza, Solidaginis, Ridens, and numerous others to replace.—*W. C. Wells; Oscott Villa, Wylde Green, near Birmingham.*

Duplicates.—Larvæ: Fuliginosa, full-fed, *Desiderata.*—Ova or larvæ. Preserving apparatus complete.—*Clem. Jolley; Arnold Road, Old Basford.*

Duplicates.—Salicis, Similis, Filipendulæ, S. Populi (4), Megacephala, Lunosa, Doubledayaria, Hirtaria, Strataria, Vitalbata (4), Lichenaria (4), Venosata (8), Lineaariata (6), Koranciata (5), Brumata (6). *Desiderata.*—Chlorana, Cristalis, Senex, Duplaris, Albovenosa, Rufa, N. Reticulata, Unanimis, Morpheus, Taraxaci, Socia, Umbra, Notha, Tripartita, Fontis, Obsitalis, Turfosalis, Cribralis, Tarsipennalis, Rusticata, Affiniata, Plumbeolata, Castigata, Sexalata, Viretata, Birivata, Berberata, Unidentata, Simulata, Certata, Rhamnata, Immutata.—*John Taylor;* 318, *Chadderton Road, Oldham.*

Duplicates. — Adonis, Argiolus, W-Album,* Artemis, Galatea, H. Comma, Statices, Griseola, Complanula, Russula (male), Arcuosa, Rubricosa, Lunosa, Munda, Fimbria,* Maura, Lutosa, Nupta, Myrtilli, Punctulata, Promutata, Emarginata, Ulmata, Rectangulata, Subnotata.* *Desiderata.* — Numerous; well set specimens of many common species. Please send list.—*A. U. Battley; Kingsfield, Hunter's Forstal, Herne Bay.*

Duplicates.—Betulæ, W-Album, Argiolus, Artemis, Aglaia, Cardui, Polychloros, Pavonia, Dominula. *Desiderata.*—Sinapis, Ægon, Athalia, Blandina, Paniscus, Versicolor, Ligniperda, Prunaria. —*A. J. Benbow; The Mount, Harefield Rd., Uxbridge.*

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SPECIFIC DIFFERENCES IN LITHOSIDÆ, AS DETERMINED BY STRUCTURE OF GENITALIA.*

By F. N. Pierce, F.E.S.

Plate I.

Lithosia sericea, Gregson, was first described by my old friend C. S. Gregson, in a paper read before the Old Northern Entomological Society on September 29th, 1860, and printed in the 'Entomologists' Weekly Intelligencer,' ix. p. 30, in which he points out the difference between it, *Lithosia complana*, and *L. complanula;* Guenée (Ann. Ent. Soc. France, 1861, 4th series, vol. i. p. 50) redescribes it under the name *molybdeola.* Both entomologists take the shape and markings of the wings as sufficient to constitute a new species, Guenée observing that the distinction of the species must depend on the discovery of the larva.

Sericea is peculiar to the Lancashire mosses, and as it has not been found elsewhere, certain doubts have from time to time been thrown on it being a good species.

Buckler and Hellins (vol. iii. p. 20) appear to supply the confirmation required by Guenée and state that the larva of *sericea* differs from *complana* in the subdorsal spots having no roundness whatever in their shape, but narrowish oblong, somewhat wedge-shaped marks; also that while in *complana* the spiracular region is occupied by one broader rust-coloured line, in *sericea* there are first a fine line of pale grey, then a line of the ground lour, and then a narrower line of the rust colour. But even is does not appear to satisfy everyone on their distinctiveness, r Meyrick, in his 'Handbook of British Lepidoptera,' page 27, ates of *sericea:* “It is uncertain whether this is anything more than a local form of *L. complana*; the larvæ are practically identical." *

---

* Read before the Lancashire and Cheshire Entomological Society, c. 6th, 1902.

Mr. Barrett dismisses it as follows: "These Lancashire specimens were at one time supposed to form a distinct species, described under the names of *L. molybdeola*, Guenée, and *L. sericea*, Gregson, but no line of distinction appears to exist."

Finally, in the 'Record,' Mr. Prout protests against Mr. Tutt recording *sericea* as a var. of *complana*; he says: "So long ago as 1867 Speyer pointed out structural differences, not only in the shape of the wings, but also in the size of the costal tuft of scales on the under side of the fore wings, not to mention its colour, &c. Until his observations have been seriously challenged, and the characters in question proved inconstant, it seems to me quite unjustifiable to sink *sericea* as a variety."

To this Mr. Tutt replied:—

"It has always been one of the greatest puzzles to me why *Lithosia sericea* should ever have been considered distinct from *complana*. To those who know *complana* over a fair part of its area of distribution there is no need to enter into details of the great difference in size, and to a less extent in wing-shape, due probably to a somewhat fuller development accompanying the larger size that exists in specimens of this species from various localities. Added to this, one finds, as a rare aberration, occasional specimens of *complana* in Kent, with the superficial appearance of *sericea* very strongly developed. With regard to Speyer's differentiation of the size of the costal tuft of scales I know nothing, nor have I at present time to investigate; but the thought arises whether this is more than a slight specialization due to the same conditions of environment that have produced what to me seems nothing more than a well-marked local race of a very widely distributed species. Cannot a parallel examination of eggs and larvæ, both obtainable in Britain, be made for specific differences, if these exist? Is not the material available for a comparison of the genitalia? At present I am a sceptic as to the specific claims of *sericea*, but my scepticism perhaps is based on very insufficient grounds. There is, I believe, in the Ent. Weekly Intelligencer, a trenchant criticism of Speyer's remarks by one of the Lancashire collectors, who took the insect freely on the mosses in the fifties."

It is interesting to note that Prout says Speyer pointed out the differences in 1867, whereas Tutt says there is a criticism of this in the 'Intelligencer,' the last volume of which was published in 1861, so that the criticism was given six years before the gentlemen wrote the article—which shows the cleverness of the old Lancashire collectors!

---

* Meyrick is quite unreliable: he puts *Oporabia autumnata*, *filigrammaria*, and *dilutata* together as one species, also *Cidaria russata* and *immanata*, whose times of appearance, hybernation of pupa, &c., and structure of genitalia, must entitle them to be considered separate species.—F. N. P.

Such, then, is our knowledge. It would be interesting to know why Mr. Barrett puts Guenée's name before Gregson's, and also why he is so dogmatic in using the word "supposed;" it evidently is not accepted, by Mr. Tutt's remarks made after Mr. Barrett's statement.

I had long wished to examine the structure of the genitalia, and very gladly accepted Mr. G. O. Day's kind offer to send me worn males. These I have very carefully examined and compared, but, alas! the result is a negative one. I can see no form of difference between the two. Some may be inclined to say: "Why, this at once settles the point; the species has been doubted all the way through; now the genitalia being identical confirms the well-grounded suspicion." But it is not so, nor is it wise to jump to conclusions from negative results. During my investigations I have repeatedly found very closely connected species possess organs so similar that I have found it impossible to distinguish any difference, although the imagines may have an abundant difference in wing-markings and breed true to type; also that the larvæ may differ. One point of differentiation is not sufficient, and although I regret that I have failed to decide this knotty question by genitalia, it will want stronger evidence than has been brought forward in the bare statements of the writers quoted, to convince me that *sericea* is identical with *complana*.

I shall presently show that there is practically no structural difference between the genitalia of *complana*, *sericea*, and *pygmæola;* and as all are agreed that the latter is a distinct species from either of the former, although having similar genitalia, therefore there is no proof of the identity of *complana* and *sericea* because the genitalia in these two species agree.

Whether the genitalia may be used exclusively for classification or not, it seems to me, will depend upon how far it aids other means. In this paper I do not intend to attempt this, but give the results as I find them, and leave it for others to make what use they like of them. The method I have adopted is to take the simplest form as the start, and gradually lead up to the highest or most complicated form. The portions I compare consist of the harpes, situated at either side of the body; the claspers, which are the hooks inside the harpes; the uncus, a large spine on the dorsal portion which projects between the harpes and which, as many of the preparations are flattened, is bent sideways; and, lastly, a most important organ connecting the base of the harpes which I call the juxta.

Lithosia mesomella (Fig. 1).—Harpes are squared at the apex; the claspers are broad for three parts, then narrowed off to a chitinous point; the uncus is slightly contracted near the tip, the juxta is wide, bent towards the centre, and corners without the acute angle.

Lithosia complana (Fig. 2).—The harpe is rounded; the clasper is broad for three quarter parts, then narrowed off to a chitinous point. The uncus is parallel, and the juxta is fairly wide with two acute angles on the upper surface, one at each corner.

Lithosia sericea (Fig. 3).—The harpe is rounded, the clasper is broad for three quarter parts, then narrowed off to a chitinous point. The uncus is parallel; the juxta is a little narrower, with two acute angles on the upper surface, one at each corner, smaller than in the preceding species.

Lithosia pygmæola (Fig. 4).—The harpe is rounded; the clasper is broad for three-quarter parts, then narrowed off to a chitinous point. The uncus is parallel, much broader than preceding species. The juxta has the two acute angles similar to the above species, but again smaller. With the exception of *pygmæola* being smaller than *sericea*, and the latter smaller than *complana*, these three species are so closely similar that I do not think I could tell the species by examination of the genitalia alone, without comparison in size.

Lithosia caniola (Fig. 5).—The harpe rounded; the clasper broad for three-quarter parts, then narrowed to a chitinous point; the uncus slightly thickened in the middle. The juxta is broad and curved, highest in the centre, gradually narrowing off and giving the appearance of steps.

Lithosia quadra (Fig. 6).—Harpe rounded and indented at the apex; the clasper sharply broadened out for one-third, where there is a little knot of spines, then as suddenly narrows into the chitinous point. The uncus strong, slightly narrower at the base. The juxta I have been unable to quite make out, but it appears to be bent over and divided into two round lobes.

Lithosia aureola (Fig. 7).—The harpe rounded; the clasper broad at the base for about a half, when it narrows off to the chitinous point, which is file-like for a small portion of the tip. The uncus is long and tapered. The juxta is bifurcated and lobed, the lobes being furnished with file-like teeth.

Lithosia complanula (Fig. 8).—The harpe is rounded; the clasper broad for about one-third, when there is a little knot of short file-like teeth, and just beyond narrows to the chitinous point, which is clothed with the file-like teeth; the uncus long and parallel, and the juxta is squarely angulated with acute angles.

Lithosia muscerda (Fig. 9).—The harpe is bluntly pointed with a projecting blunt tooth on the lower apex; the clasper broadens out for a little over a third, when it becomes clothed with the file-like teeth and narrows off to a point. The uncus is long and slender, but not acutely tapered until near the tip; the juxta is rounded.

Lithosia helveola (Fig. 10).—The harpe rounded; the clasper is parallel for three quarter parts, when it narrows, then widens to narrow again to a sharp tip, beak-like. The uncus is short, wider near the apex and pointed, and the juxta is deeply indented in the centre, the tips being long-pointed.

Lithosia griseola (Fig. 11).—The harpes are pointed; the clasper rapidly broadens out, when it takes a round turn; toothed at the edge of the rounded portion, falling almost straight down to the chitinous point; the uncus is elegantly shaped upwards, when it broadens out and is abruptly angulated to a point. The juxta is produced into a long chitinous spine about half as long as the harpes.

Lithosia rubicollis (Fig 12).—The harpe is rounded; the clasper runs up fairly parallel to about three-quarters, when it takes a backward curve, leaving a deeply emarginate curve, and then makes the chitinous point. The uncus is very long and tapered, and the juxta is bifurcated into two round lobes.

Lithosia miniata (Fig. 13).—The harpe broadens out and becomes deeply emarginate at the apex; the claspers about a third up become thickly clothed with fine spines up to about three-quarters, when it makes its chitinous point; the uncus is long and parallel, and the juxta is not distinguishable in my preparation, but this is immaterial on account of the distinctness of the harpes and claspers.

With regard to the tuft of scales on the under side of the costa, which I believe is referred to by Speyer, whose article I have not seen, although I have searched through the 'Entomologists' Intelligencer' for the criticism mentioned by Tutt. This tuft of scales lies under the yellow stripe, and is, as far as I can see, about the same length in good specimens of *complana* and *sericea*, but is very different in colour, being yellow, same as the costa in *complana*, and silky grey in *sericea*.

This brings me to the shape of the wing, which in *sericea* is said to be narrower than in *complana*. I cannot agree that this is so, for in all the specimens of *sericea* that I have seen the fore wings have not been fully flattened out in setting, and as they are apparently inclined to fold over on the costa, the collector does not appear to have taken sufficient care in setting, and thus the costa is in each case bent over, giving an appearance of narrowness to the wing; but may there not be some real reason for this undevelopment? The species is known to run smaller as a rule, and of course raises the question of unsuitability of food, environment, &c., which, if carried to an extreme extent, may produce *pygmæola*.

I think it is now generally accepted that dampness is one cause of melanism. One of the differences given is that the hind wings are darker. It has been pointed out by Mr. Joseph Collins, of Warrington, who rediscovered the species, that since his acquaintance with it some of the localities have been drained, with the natural result that the darkness of the hind wings has to a certain extent disappeared, or, at any rate, is not so marked as in old specimens, but that the silkiness of the wings (from which Gregson named the species *sericea*) is still the same. It would be interesting to know if Mr. Tutt's Kent specimens occasionally show this silkiness, or does the "superficial appearance" he speaks about only belong to the darkening of the hind wing?

To sum up, I give the arguments in favour of *sericea* being a variety on the one hand, and a good species on the other:—

FOR BEING A VARIETY.	FOR BEING A SPECIES.
Peculiar to mosses.	Shape of fore wing.
Similar specimens found in Kent (Tutt).	Colour of costal tuft.
Dampness producing melanism.	Difference in larvæ.
	Colour of hind wings.
	Silkiness of fore wings.
	Genitalia—because *pygmæola* is also similar to it and *complana*.

With these points I leave the matter. I do not think the variety theory has at all been proved. I am therefore of opinion that until eggs of *sericea* produce undoubted *complana*, and *vice versâ*, old Gregson's name and differentiation will stand good, and that we have two species in *Lithosia complana* and *Lithosia sericea*.

The Elms, Dingle, Liverpool.

Explanation of Plate.

1. *Cybosia* (*Lithosia*) *mesomella*.
2. *Lithosia complana*.
3. *Lithosia sericea*.
4. *Lithosia pygmæola*.
5. *Lithosia caniola*.
6. *Œnistis* (L.) *quadra*.
7. *Lithosia aureola*.
8. *Lithosia complanula*.
9. *Pelosia* (L.) *muscerda*.
10. *Lithosia helveola*.
11. *Lithosia griseola*.
12. *Gnophria* (*L.*) *rubicollis*.
13. *Miltochrista* (*Calligenia*) *miniata*.

[The editor is responsible for generic names in the Explanation of Plate.]

SOME BRITISH FORMS OF *MELITÆA AURINIA*.

By Percy E. Freke, F.E.S.

I have been much perplexed by this extremely variable species, and I have found my first efforts to learn something definite about its many forms have only led to greater perplexity and confusion.

On looking over a mass of material from many localities, and trying to make it fit in with some of our leading recognized arrangements, Mr. Tutt's or Mr. Kane's for instance, I have found only too often my attempts have left my comprehension of the subject in a worse state than ever. In this I am not alone. Some of my friends, men too of some experience, have very indefinite opinions on the subject, or no opinion at all. I therefore set about systematically studying the markings in detail, following each spot or blotch through its variations, and endeavouring to arrive thereby at a more definite understanding of the classification and distribution of the species. My experience and material, however, are very limited compared with those of many others, and I have therefore set down the following notes in the hope that someone who has more thoroughly mastered the subject may be able to help me, and others like me, to a better comprehension of it.

Melitæa aurinia (Rott.).—Upper side. Fore wings.—From the costal margin to the costal nervure is the dark blackish brown which forms the boundaries of most of the colour spaces. This I speak of hereafter as dark. Here it is more or less flecked with ochreous or light scales.

The inner margin to the first nervure is dark throughout its whole extent. The base of the wing is dark. Beyond that the discoidal cell is divided into four most irregularly shaped areas or spots, of which the first and third are ochreous, and the second and fourth fulvous red. Another fulvous, acutely triangular spot occupies the space at the junction of the second nervure with the discoidal cell.

Beyond the dark base of the wing, between the first and second nervures, are four irregular spots, corresponding in colour to the four in the discoidal cell, and which with them might almost be said to form four bands across the base of the wing, were it not for their very irregular shape, and that the fourth band is broken by the triangular spot before referred to.

Outside the discoidal cell—towards the hind margin—is a double ochreous row (the first row), separated and bounded by dark bands, and further broken up by the dark nervures into a double series of elongated, somewhat quadrangular, ochreous blotches, longest in the centre, and narrowing into shorter and often irregular spots, as they approach the costal margin and the middle of the wing. The double row of ochreous spots is continued as a single row to the first nervure by broadly marked quadrate blotches.

Outside the dark mark which bounds the ochreous, a reddish-fulvous band (the second row) passes across the wing to the first nervure, and is broken by the dark nervures into quadrangular spots with ochreous centres, having their hind margins concave, and that next the base of the wing convex. Beyond this, and separated from it by a dark waved band, is a row of semilunar spots (the third row), their convex sides next the base of the wing being ochreous, and their straight sides next the hind margin fulvous. Between this row and the hind margin, and parallel to it, is a narrow double dark line with slight fulvous interspace. The fringe is a mixture of dark and ochreous scales, those at the ends of the nervures being all dark. No two specimens, however, agree exactly. The colour of the costal marginal area varies according to the preponderance of the light scales. The areas I have mentioned as crossing the base of the wing vary greatly in relative size and in outline, and are often more or less obliterated by the extension of the dark colour.

The rows of ochreous spots beyond them are often suffused with fulvous, thereby approaching var. *artemis*. The band of fulvous blotches beyond them varies in colour according to the extension, contraction, or obliteration of their ochreous centres. The succeeding row, which I have described as semilunar, are sometimes extended to squarish blotches, at others reduced to specks. The double narrow black band is frequently fused into a single dark marginal stripe, beyond which the only light scales are found in the fringe. This is often distinctly banded, dark at the ends of the nervures, with quite light interspaces.

The Hind wing.—The base and inner margin are dark. Near the base of the discoidal cell is generally a small ochreous spot, followed by a dark patch, then ochreous, and then fulvous. Behind the discoidal cell (towards the hind margin) runs a row, or series, of elongated ochreous spots, corresponding to, and practically a continuation of, the first row of the fore wing. These become shorter and more quadrate as they near the anal angle.

Behind the dark line which bounds these is a second row, the most conspicuous, and the most persistent through all varieties, of any of the wing markings. The spots are large quadrilaterals, roughly speaking, though their hind margins are concave. They are a bright fulvous red, with a well-marked round black spot in the centre. They are practically a continuation of the second row of the fore wing. The third row, next the hind margin, being a continuation of the third row of the fore wing, is composed of semilunar spots, their hind margins being the straight side. The colour, however, differs from that of those on the fore wing by being very pale straw colour without any fulvous or ochreous. Behind them are the dark marginal band (double or single as in that of the forewing) and the fringe.

Variety is chiefly in the extension of the dark basal area, which reduces or obliterates the coloured spots, and which reduces, but I think never obliterates, the ochreous spots of the first row. In the colour of the red bands, from bright fulvous red to dull orange. In the hind wing, in the extension of the fulvous second row, which sometimes, near the costal margin, obliterates the first row, and in the size of the semilunar spots of the third row, which when enlarged become very striking owing to their pale colour, but which are frequently reduced to mere dots or streaks by the extension of the marginal black border. The black dots in the centre of the second row of spots vary considerably in size, being sometimes mere dots, at other times becoming decided quadrate spots, and sometimes appearing also in the spots of the first row.

In any given locality where the species occurs it is generally found that the stamp of the local variety, whatever it may be, exercises a predominating influence over most of the specimens taken there. The local variety in its most pronounced form is not usually the most abundant. Often do we find the great mass of our captures are individuals showing a strong affinity to the standard of the local variety, but embodying therewith a leaning towards one or other forms of the species, with occasionally a more decided approach to such forms.

In this way, I believe, the type form of *aurinia* is perhaps the most widely spread in Britain. In almost every locality therein from which I possess specimens, an approach to the type shows itself in some individuals. Rarely pure, I admit, in many places, but coloured more or less by the local race. Most decided in northern England and southern Scotland. Less so in southern Ireland, the south-west of England, and south Wales. Still less so in central Ireland. Least of all, perhaps, in south-eastern England. Some specimens from Saxony are very markedly of this form, though var. *artemis* perhaps prevails more in many continental localities.

(To be continued.)

THE YOUNG LARVA OF *LIPHYRA BRASSOLIS*, Westw.

By T. A. Chapman, M.D., F.E.S.

Referring to my note as to an error in connection with this larva ('Entomologist,' 1903, p. 36), it appears from a letter just received from Mr. Dodd that there is no immediate chance of the problem being cleared up. In my note, I acted on Mr. Dodd's definite statement that the larva described was that of a moth, and not that of *L. brassolis*. It now, however, appears that he only infers this to be a moth because it resembles another which he knows to be a moth and is in fact not very distantly related to *Tinea*. Of the larva before us he knows nothing, except that it eats the ant larvæ, precisely what he tells us of *L. brassolis*. He does not know what becomes of it. He does not know the larva of *L. brassolis* in the younger instars.

Now this larva before us is certainly *not* a micro, except perchance a Limacodid or Zygænid. If it were a Limacodid, one would expect some cutaneous armature on so small a larva.

The main point, however, is that Mr. Dodd's surmise that this larva is a Tineine is only a surmise, and, at that, without foundation. Queensland may have surprises in store for us as to larval structure, as in other things, but I think we must not invent them before they are proved.

This small larva is, then, a macro, with high probability a Lycænid. What, therefore, more likely than that it is the desired young larva of *L. brassolis?* It will certainly be curious, should this be so, that Mr. Dodd should have accidentally forwarded it as such without knowing he had done so, and believing all the time it was something else.

Provisionally, then, and as a working hypothesis till the contrary is proved, I assert that this larva is the young larva of *L. brassolis.*

It is only just to Mr. South to say that he has throughout believed that this *was* the larva of *L. brassolis*, but, like myself, had to bow to Mr. Dodd's apparently definite statement.

I do not know that Mr. Dodd will have any objection to my quoting the following from his letter of Jan. 12th, 1903:—

"The drought has killed many trees, and caused many others to drop their leaves, so that they were as bare as English trees in the winter; consequently there has been very little food for the green ants, and they have perished in many places where they were very numerous before; and where the ants have outlived the drought, there were to be found no signs of '*brassolis.*' It is just possible that in such a time of scarcity the ants were compelled to eat any larvæ in their nests; no doubt if they tackled them in their early stages they could easily destroy them.

"When I obtained my fine supply (they emerged last January), I naturally expected a big crop would follow and be obtainable in the nests in various localities, but much searching ended in keen disappointment.

"I have not seen a larva during the whole year . . . "

. . . .

"From the ants' nests I obtain two larvæ, one with rounded segments (same as you received from Mr. South), another with toothed or saw-like edges. I know nothing of the round-segmented one, except that is in the ants' nests and sucks their larvæ.

" . . . . It is absolutely certain that *L. b.*, in its maturer stages, feeds upon ant-grubs."

Betula, Reigate: February 24th, 1903.

DESCRIPTIONS OF SOME NEW SPECIES OF CLYTHRIDÆ (PHYTOPHAGOUS COLEOPTERA).

By Martin Jacoby.

(Continued from p. 64.

Melitonoma occipitalis, sp. n.

Fulvous; the breast and abdomen black; eyes surrounded by a black stripe; thorax extremely minutely punctured with four spots placed transversely; elytra very closely and distinctly punctured; a small humeral spot, another below the scutellum, and a third one, larger, near the apex, black. Length, 6 mill.

Hab. Salisbury, Mashonaland (*G. Marshall*).

Of subcylindrical shape; the head fulvous, with three foveæ, placed in a triangle, rugosely punctured between the eyes, the latter large, ovate, entire, preceded by a narrow black band; clypeus triangularly emarginate in front, labrum flavous; antennæ extending to the middle of the thorax only, black, the lower three joints flavous; thorax transversely subquadrate, the sides nearly straight, the posterior angles rounded, the disc with a few fine punctures at the sides, fulvous, with four round black spots placed transversely; scutellum pointed, fulvous, the base black; elytra rather distinctly lobed below the shoulders, very closely, finely, and irregularly punctured, the interstices finely transversely wrinkled below the middle, the shoulders with a small black spot, a larger spot placed near the suture below the base, and another much larger one of elongate shape near the apex of each elytron; legs entirely fulvous; under side black, closely pubescent.

Of this very distinct species Mr. Marshall obtained two specimens, of which I am not able to state the sex with certainty; the tarsi are rather short.

Melitonoma clavareaui, sp. n.

Pale flavous; the head, femora, and the abdomen partly black, closely pubescent; thorax impunctate; elytra very finely and closely punctured, each with five small black spots (1, 2, 2); tibiæ and tarsi flavous. Length, 6½ mill.

Hab. Guelidi, Africa.

Head flat, black, closely pubescent, the epistome triangularly emarginate, the vertex impunctate; eyes large, entire; antennæ extending to the base of the thorax, black, the lower three joints flavous; thorax strongly transverse, much narrowed at the sides, the anterior margin straight, the posterior angles rounded, the surface impunctate, flavous, shining; scutellum black; elytra very closely, finely, and irregularly punctured, feebly lobed below the shoulders, flavous, with the usual five small black spots, one humeral and the others slightly before and below the middle, placed transversely; below densely pubescent, of silvery tint, the legs rather long and stout, the tibiæ and tarsi flavous, the first joint of the latter as long as the following two together; the first or the first two abdominal segments flavous, the others black.

Lacordaire has described three species in which the tibiæ and tarsi are likewise flavous; these are *M. truncatifrons*, in which the head is impubescent and finely strigose, and the elytra have an oblique band, although this is sometimes divided into spots as in the above species. *M. sobrina*, Lac., is described as having the tarsi nearly as long as the tibiæ, and belongs perhaps to another genus. The third species (*M. litigiosa*) has the thorax of subquadrate shape, and not narrowed in front; in the present species this part is much deflexed at the sides, and the latter are greatly narrowed; the colour of the abdomen is also different. I have probably only female specimens before me, which I received from Mons. Clavareau, with the locality as given.

PEPLOPTERA BRAUNSI, sp. n.

Black; thorax fulvous, with three black bands, impunctate; elytra strongly punctate-striate, flavous; a sutural band, abbreviated anteriorly, a short stripe at the middle of the lateral margins, and an oblique spot on the shoulders, black; the apex of the tibiæ flavous.

Mas.—Thorax broad, the tibiæ strongly dilated, the anterior ones slightly curved. Length 8 mill.

Hab. Algoa Bay (*Dr. Brauns*); Dunbrody (*Rev. O'Neil*).

Very closely allied to *P. curvilinea*, Jac. (Trans. Ent. Soc. 1901), but certainly distinct. The head black, rugose punctate between the eyes, and with a rather deep fovea at the middle; antennæ black, the lower four joints flavous; thorax broad, with rounded sides, fulvous, entirely impunctate, the sides with an elongate black spot from the base to the middle, the disc with a black band, broad at the base, strongly narrowed anteriorly, and extending to the anterior margin; scutellum black; elytra with strong regular and closely placed rows of punctures, the shoulders with an elongate oblique black spot, the lateral margins with a narrow black stripe from before to below the middle, the suture with a very regular black band not extending to the base; under side closely pubescent, the femora strongly thickened, the tibiæ dilated, flavous, except the extreme base; tarsi very broad, dilated.

The thorax in this species is broader than in *P. curvilinea*, and has three black bands instead of one, and the sutural stripe is of regular shape, not widened posteriorly; the tibiæ of the male are more strongly dilated, and of almost entirely flavous colour; lastly, the species is larger and broader in shape. I received three specimens from Dr. Brauns in Natal, and several others from the Rev. O'Neil in Cape Colony.

MICROPYGA, gen. nov.

Elongate and subcylindrical; eyes rather small; thorax transverse, the sides strongly rounded and narrowly margined, the basal lobe broad but feebly produced, posterior angles rounded; scutellum pointed; elytra distinctly but not strongly lobed below the shoulders, only partly covering the pygidium; legs rather elongate, the tarsi moderately broad, their first joint as long as the following two together.

There is no genus amongst the Clythridæ into which the present species may be satisfactorily placed, principally on account of the strongly rounded and widened sides of the thorax and the partly uncovered pygidium, which agrees nearly with *Diapromorpha*, but the thorax in that genus is of totally different shape.

MICROPYGA TRANSVALENSE, sp. n.

Under side black, pubescent; upper side fulvous: thorax impunctate; elytra strongly punctured in closely approached rows; a semicircular spot on the shoulders and a transverse band below the middle black; base of the tibiæ fulvous. Length, 7 mill.

Hab. Transvaal.

Head impunctate at the vertex, the latter convex, intraocular space finely rugosely punctured, with a single small fovea; another one is placed at the base of the antennæ; clypeus very feebly emarginate anteriorly, the anterior edge black; eyes slightly notched; sides of the head truncately produced below the eyes; antennæ comparatively elongate, black, the fourth and following joints strongly transversely serrate; thorax twice as broad as long, of equal width, the sides and the posterior angles strongly rounded, the disc rather convex, entirely impunctate, fulvous; scutellum rather broad, obsoletely carinate, blackish; elytra not wider at the base than the thorax, the basal margin ridge-shaped, the punctuation arranged in closely approached irregular rows; an angular semicrescent spot or band placed at the shoulders, not extending to the suture, and another slightly oblique band below the middle extending nearly to either margin, and slightly widened near the suture, black; under side black, closely pubescent, the base of the tibiæ fulvous; prosternum not visible between the coxæ.

I have three specimens before me, which I received from Mr. Fruhstorfer.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

BY DR. H. J. HANSEN.

(Continued from p. 67.)

4. *Fulgoridæ.*—This family naturally falls into two principal divisions, *viz.* Fulgorinæ and Delphacinæ, the last being marked out by the long-known powerful movable *spur* at the apex of the posterior tibiæ, whilst this spur is lacking in all Fulgorinæ; in the next place (see above) *the sensory organs on the second peduncular segment of the antennæ* are furnished with bristles in the Delphacinæ, but in the Fulgorinæ with lamellar lobes, "blades," which sometimes are feebly but generally very well developed.

The division Fulgorinæ may be again divided, but this I am not able to realize in detail owing to the inadequacy of my material for research. Of Stål's twelve subfamilies belonging to this family, a considerable number must be rejected, partly because the characters employed by this author are of a largely heuristic nature, and of poor value; partly because the antennal sensory organs (see above) belong to different types, whose occurrence points to the presence of natural groups as their occurrence coincides with other peculiarities in the insect's structure. Thus at least the "Fulgorida," "Dictyopharida," and "Cixiida," Stål, must be thrown into one group, whose sensory organs (in the genera examined by me) are endowed with an encircling of spiniform processes; there is also strong agreement in the structure of the empodia, &c. Next, at least the "Eurybrachida" and "Issida" must be amalgamated, though from the last-named "subfamily" the peculiar genus *Tettigometra*, and perchance other forms, must be separated; the group thus composed (with *Issus*, *Eurybrachys*, and *Calliscelis* as important representatives) is characterized by their sensory organs showing from some to many plain "blades," but not any surrounding circle of spines. *Tettigometra* (at least with the addition of the surely very closely allied *Isthmia*, Stål, unknown to me) must stand as type of a little group characterized by the above-mentioned conspicuous sensory organs, and by the altogether peculiar structure of the insects. Then "Ricaniida" and "Flatida" (and perchance "Acanoniida," Stål) must be thrown together, showing strong similarity in the structure of the wings, scutellum, &c., and agreement in the sensory organs, which are surrounded by peculiar processes, and possess exceedingly few sensory "blades." On "Achilida," "Tropiduchida," "Derbida," and "Lophopida," I do not venture to express any opinion; the probabilities are that in the end a portion of their forms must be placed in the same group as *Cixius*, while the rest may possibly form one whole group, or very few small ones.

I perceive quite well the meagreness of this last section of my paper, on account of the entirely inadequate research, and its lack of thoroughgoing sharp characterization, and I ought therefore, perhaps, not to have dealt with it. On the other hand, it occurs to me, however, to contain divers propositions, critical elucidations and hints, that will be of significance for a future systematist, who, with the aid of lens and microscope, will undertake the difficult task of a thoroughgoing group-erection of related Jassid and Fulgorid genera, with adequate material; this last is absolutely necessary, if these erections are to possess some lasting value. If this aim is approached, I think then that this section (with the more special researches on antennæ, tibiæ, and tarsi, on which it is based) will have its justification as a small preliminary work.

ON THE PARASITIC HYMENOPTERA AND TENTHREDINIDÆ COLLECTED BY MR. EDWARD WHYMPER ON THE "GREAT ANDES OF THE EQUATOR."

By P. Cameron.

In the "Supplementary Appendix" to Mr. Edward Whymper's 'Travels amongst the Great Andes of the Equator,' 1891, I described the ants taken by Mr. Whymper during his memorable journey in Ecuador in 1880. The parasitic species are not numerous, being only twelve in number, but the new genera are seven. They are, however, of great interest from their having been taken at great elevations, most of them having been captured at altitudes of from 7000 to 13,300 ft. Some of the genera recorded in the 'Travels,' p. 356, are erroneous, or are used in a wider sense than they are by more recent writers.

ICHNEUMONIDÆ.

Ichneumonini.

Tyanites, gen. nov.

Post-petiole widely dilated; its width double its length dorsally-ventrally; the apex of the abdomen bluntly pointed. Median segment without teeth; the areola large, longer than wide, at the base separated from the depression by a keel; the lateral areæ are not distinctly separated. Apex of clypeus bluntly rounded, almost transverse. Antennæ as long as the abdomen, short and stout; the basal joints of the flagellum not much longer than wide. Areolet 5-angled, much wider at the apex than at the base, through the cubitus having an oblique slope from the base to shortly beyond the middle; the disco-cubital nervure without a stump of a nervure. Legs short and stout; the tarsi stoutly spinose on the under side.

The head is well developed behind the eyes; the face is flat and not clearly separated from the clypeus; the apical tooth of the mandibles is long and sharply pointed; the subapical is short and blunt. The pronotum is bordered laterally by a stout keel, and there is a stout keel between the two hinder coxæ. Scutellum large, flat; at the base it is as wide as its length; it becomes narrowed gradually towards the apex, and is not margined at the sides; the post-scutellum is widely bifoveate at the base. The post-petiole is flat in the middle, and not much raised above the sides. The second segment is smooth; not striated at the base. There are seven abdominal segments; the last is well developed all round, and is as large as the preceding. The third and fourth joints of the tarsi are distinctly narrowed at the base, and widely roundly emarginate at the apex.

Comes near to *Probus*.

Tyanites rufipes, sp. nov.

Black; the basal half of the antennæ reddish-yellow; the apical half brownish beneath; a mark on the pronotum and the scutellum yellowish; the basal two segments of the abdomen red; the legs ferruginous-yellow, with the coxæ and trochanters black; the wings hyaline, the stigma testaceous, the nervures darker coloured. ♀. Length, 11 mm.

Hab. Hac. Antisana, 13,300 ft.

Head black; the inner orbits and the sides and apex of the clypeus yellow; the mandibles for the greater part rufous. Face strongly punctured, closely in the centre, more sparsely on the sides; the clypeus has a row of punctures on the upper and lower edges. Front and vertex closely and coarsely, the outer orbits more widely and not so strongly punctured. Mandibles dark rufous, their apex black. Palpi dark testaceous. Pro- and meso-thorax closely and distinctly punctured; the sternum smooth and more shining. The edges of the propleuræ behind are irregularly striated; and there are some stout striæ below the hinder edge of the tubercles. The metapleuræ are, if anything, more strongly punctured than the meso-. Scutellum punctured closely, but not strongly, round the sides; the central part is only sparsely punctured. Post-scutellum coarsely aciculated and closely punctured; the basal foveæ are large, round and deep. Metanotum coarsely, closely rugosely punctured; the apical slope is closely rugose; the lateral apical keel in the middle projects into a broad, not very prominent, tooth. Legs covered with a pale down; the tibial and tarsal spines are rufous. The petiole is dark rufous (perhaps it is discoloured), the post-petiole is closely punctured; the second segment is ferruginous; the gastrocœli shallow, impunctate.

VABSARIS, gen. nov.

♂. Antennæ not longer than the abdomen, stout, distinctly tapering towards the apex; the joints not serrate. Head with the temples broad, rounded, not obliquely narrowed. Face flat; the apex of the clypeus broadly rounded. Scutellum roundly convex, not much raised above the level of the mesonotum; its sides not keeled. Median segment not spined; its spiracles small, about three times longer than wide, straight, rounded at the base and apex; the areola distinctly wider than long. Wing areolet 5-angled; the disco-cubital nervure without a stump of a nervure. Abdomen bluntly pointed at the apex; the ventral keel is on segments 2, 3, and 4. Legs short and stout; the tarsi thickly spinose.

There is a narrow keel before the middle of the propleuræ; the face slightly projects in the middle; the areola is widely separated from the base of the segment, which is widely, deeply depressed, and has its sides bordered by a keel.

In Ashmead's arrangement (Bull. U. S. Nat. Mus. xxiii. p. 18) this genus would come in near *Amblyteles*. I only know the male; but that should be readily known by the short thick antennæ, by the broad temples, rounded, not obliquely narrowed, behind, by the median segment not being spined, and by the short metathoracic spiracles, which are not only shorter, but broader than they are in *Amblyteles* or *Pseudamblyteles*.

VABSARIS FORTICORNIS, sp. nov.

Black; the legs, the second abdominal segment, the apical two-thirds of the third, and two marks on the centre of the fourth, ferruginous; the coxæ and trochanters black, and there is a broad black band on the under side of the hinder femora at the apex; the wings are hyaline; the stigma light, the nervures dark, testaceous. ♂. Length, 10 mm.

Hab. Hac. Antisana, 13,300 ft.

Antennæ black, stout, distinctly tapering towards the apex; short, not much longer than the head and thorax united. Head black, the inner orbits narrowly yellow; strongly and closely punctured, except the clypeus and the lower part of the front; the clypeus smooth, with an irregular row of punctures round the top and bottom. Mandibles black, broadly rufous in the middle. Palpi pale testaceous and covered with white pubescence. Thorax closely and strongly punctured, and thickly covered with white pubescence; the basal half of the propleuræ is smooth in the middle, sparsely punctured on the top and bottom; the punctures on the apical half are close, large and elongate. The scutellum is punctured; the punctures are smaller and more widely separated than they are on the mesonotum. Metanotum irregularly rugosely punctured; the posterior median area is closely transversely striated. Legs rufo-testaceous; the coxæ and trochanters are black; the tarsi are thickly spined. The petiole is sparsely punctured; the post-petiole impunctate; the second segment is obscurely punctured round the edges; the gastrocœli smooth, shallow; the third segment is closely, but not very strongly, punctured; the others are smooth.

HEMITELINI.

LARSEPHNA, gen. nov.

Median segment with two distinct transverse keels and no lateral ones. Metathoracic spiracles oval. Discoidal cellule closed at apex. Transverse median nervure in hind wings not broken; the first abscissa of radius half the length of the second. Antennæ 22-jointed, the basal three joints of flagellum equal in length. Parapsidal furrows indistinct and widely separated.

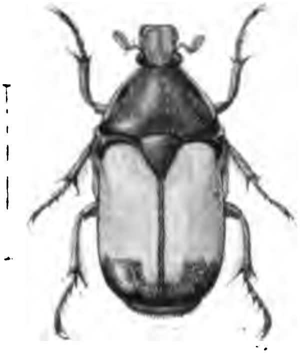
The eyes are large. The cubitus is obliterated beyond the areolet; the metapleural keel is complete; the basal keel on the metanotum is broadly turned backwards in the middle, and is united to the base of the metanotum by two short oblique keels, which form a small area. The apex of the clypeus is rounded; the occiput is margined. Stigma large, triangular.

This genus is referred to the *Hemitelini* from its general body form, and from the alar neuration; but the absence of longitudinal keels on the metanotum and its consequent absence of areæ are more characteristic of the *Cryptina*. There is a genus of *Hemitelini*—*Chirotica*, Foer.—which has not the metanotum areolated; but the present species cannot be referred to it.

(To be continued.)

DESCRIPTION OF A NEW CETONIID BEETLE FROM BRITISH EAST AFRICA.

By E. A. Heath, M.D., F.L.S.



Plæsiorrhina ugandensis, sp. nov.

Head, pronotum, and scutellum brownish olivaceous, lateral margin of pronotum, the elytra, the sternal process, a small spot at the base of head beneath, sternum and abdomen, luteous; base of the elytra, sutural margin, and apex of the elytra a little transversely produced upward on each side, brownish olivaceous. Elytra, scutellum, and thorax finely punctured, the segments of the abdomen in alternate bands of luteous and brownish olivaceous. Legs luteous, with their upper margins blackish olive. The tibiæ of the middle, and hind legs, finely fringed with yellowish hairs, as also is the olivaceous pygidium. Long. 9 lines. Max. lat. 5 lines.

Hab. Uganda, B. E. Africa (W. A. Crabtree).

NOTES AND OBSERVATIONS.

The Insect Fauna of the County of Essex.* — There are probably few among the present generation, particularly those who dwell in the less urban districts, who do not take an interest in some branch of natural history, the study of insect life in some form perhaps being the most popular. To such, a well-compiled list of the fauna of a given area is a useful work of reference, and those responsible for the plan of the "Victoria History" have done well in devoting a large share of the space at their disposal to this subject.

The section under notice occupies 102 pages, of which the first is devoted to an introduction, setting forth the sources from which the information for compiling the lists has been obtained, and the methods employed in dealing with it. Orthoptera occupies three pages, in which some twenty-one species, namely three earwigs, three cockroaches, seven grasshoppers, six locusts, and two crickets are enumerated. To the Neuroptera and Trichoptera the next four pages are devoted, about three-fourths of the known British species of dragonflies being mentioned. Hymenoptera claims nineteen pages; Coleoptera nineteen; Lepidoptera forty; Diptera nine; Hemiptera five; and the remaining two pages are occupied with a brief life-history of the Aphides. It will thus be gathered that something more than a mere list of names is given, and even in those orders where this barren system has been resorted to, much of the objection that might be taken to it is removed by an introduction setting forth the chief characters of the order dealt with, and calling attention to the more important species and their economic bearings. The Lepidoptera is treated in narrative form throughout, and forms a very interesting and complete history of that order for the county of Essex. English names are used for the butterflies, Sphinges, and Bombyces, and for some of the more familiar species in some other orders, but, as they are invariably accompanied by bracketed scientific names, identification is easy, and no exception can be taken to their use; indeed, having regard to the class of readers into whose hands a county history is likely to fall, their retention is perhaps an advantage.

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* Section "Insecta" from the 'Victoria History of the Counties of England.' (London, 1903. Archibald Constable Limited). Issued to subscribers only.

The name of the compiler of the lists is not definitely stated, but we have good reason for believing that this portion of the work was carried through by Mr. W. H. Harwood, than whom few have a better all-round knowledge of this county's insects, or would be better able to make full use of the information generously supplied by the numerous field-workers and specialists whose names appear in the first page of this section.

The first sentence of the introduction concludes with the words, "It is hoped that the information now given will be of value as well to the student of economic entomology as to the collector,"—a hope that we cordially endorse, but we wonder how many "collectors" or "students of economic entomology" there are in this agricultural county of Essex that are in a position to obtain the costly volumes in which the information is contained. It seems a pity that these interesting lists, purposely written in a popular style, should not be obtainable as separata at a popular price.—R. A.

LARVÆ OF VANESSA POLYCHLOROS.—In the summer of 1901 I found a brood of the larvæ of this butterfly feeding on one of the highest branches of a balsam poplar in my garden, and, as I wanted a fresh series, I shook some of them down, and placed fifty of the largest in a breeding-cage. They were then nearly full-grown, and in the course of a few days all had changed to healthy-looking pupæ. But I only bred one butterfly, the other pupæ being all stung, and upon opening some of them I found them crammed with the small larvæ or pupæ of *Apanteles*; some of them contained more than a hundred. Last season these larvæ were unusually abundant, and on July 8th, while riding between Dovercourt and Walton-on-the-Naze, I must have seen scores of their nests on elms by the roadside. From these I obtained fifty that were just full-grown, and fifty about a quarter-grown. The latter I sleeved on a wych elm in my garden, and thought, as they were so small, they would probably be free from parasites. But from the hundred or so pupæ I only bred one butterfly, the remaining pupæ, as in the previous year, being all stung. Are these larvæ usually so dreadfully infested? Very few seem to have escaped last year in this neighbourhood, for I do not remember having seen any of the butterflies on the wing during the late summer, and if only a small proportion of the larvæ that were about had produced imagines I should surely have seen some of them.—**Gervase F. Mathew**; Dovercourt, Essex, March 18th, 1903.

The Mild Weather.—We have had some remarkably mild weather here since the beginning of last month. Hawthorn bushes were bursting into leaf in sheltered places as early as February 9th, and sallows were in bloom before the end of the month. At the present time the hedges are looking quite green where there is much hawthorn, and elm shoots, willow, blackthorn, bramble are all coming out. I visited the woods yesterday, and found some of the sallow bushes already passing. *Pieris rapæ* was seen on February 18th and 19th, and yesterday *Vanessa cardui* was noticed sunning itself on a brick wall.—**Gervase F. Mathew.**

The Habits of Tachytes and Paranysson.—On June 7th, 1899, I found some large wasps of the genus *Tachytes* burrowing in the soil on the campus of the Agricultural College at Mesilla Park, New Mexico. They made mounds about two inches high and six in diameter, the tunnel being half an inch in diameter, and going down a foot or more. Owing to the extreme looseness of the soil, I was quite unable to trace the burrows to the end; one, which I left apparently hopelessly spoiled, was nevertheless opened up again by the wasp next day. The specimens of *Tachytes* captured were females, and in Fox's table (Proc. Philad. Acad., 1893) they run to *T. crassus*, from which they differ by the red femora. I do not regard them as representing a new species, however, as I am confident that they are *T. exornatus*, Fox, known hitherto only in the males. *Paranysson texanus*, Cresson, was very common about the burrows, entering them freely, as though it were parasitic on the *Tachytes*. What we are to understand from this fact, I do not know.—**T. D. A. Cockerell.**

"Emperor of Morocco."—In reply to Mr. W. F. Kirby's question (*ante*, p. 17), I note that the Rev. F. O. Morris, in his 'History of British Butterflies,' uses the name "Emperor of Morocco" as a synonym of "Purple Emperor."—**R. F. Towndrow**; Malvern Link.

Ovipositing of Erastria fuscula.—For the past few years I have attempted without success to induce *Erastria fuscula* to oviposit. I have enclosed sprays of bramble and raspberry with the female, both of which are given as its food-plant. *Molinia cærulea*, or purple melic-grass, I have not tried, as I have never found it growing where I take the insect. Perhaps some entomologist who has met with better success will come to my assistance.—**Chas. E. Partridge**; 72, St. John's Park, Blackheath.

Merrin's Calendar.—We are pleased to hear that it is proposed to issue a new edition of 'Merrin's Lepidopterists' Calendar.' The work is being undertaken by E. E. B. Prest, M.A., F.Z.S., and H. M. Stewart, M.D., M.A. We understand that these gentlemen will cordially welcome any offers of help from practical lepidopterists, and any entomologist willing to assist is asked to communicate with E. E. B. Prest, Awa, Dacres Road, Forest Hill, S.E.

Cassida viridis in Canada.—Last summer, Mr. A. F. Winn, of Montreal, when on a collecting trip at the Lévis Heights, Quebec, obtained a large number of a species of tortoise-beetle new to our cabinets. Considerable attention was drawn to this insect, on account of the authorities differing as to identification. The Rev. E. Roy, Lévis College, published a long account of it, with illustrations, in 'Le Naturaliste Canadien,' xxix. 145, calling it *C. thoracica*, Ill., a species known in the United States; and the Rev. Dr. T. W. Fyles, also of Lévis, in the 'Canadian Entomologist,' xxxiv. 273, recognized it as *viridis*, Linn. These differences of identification created quite a searching up of references and looking for types. By the kindness of B. Towlin, Chester, England, who sent me specimens of *viridis* captured in Cardiff, Wales, I am now sure that the Rev. Dr. Fyles is right. They have apparently come to stay, as large numbers were found feeding on the burdock, *Arctium lappa*, Linn., a weed no one will object to their eating up. It must have been carried over among the food for animals brought to this country.—Charles Stevenson; Montreal, Que.

CAPTURES AND FIELD REPORTS.

Larva of Plusia moneta.—I thought it might interest your readers to know that the larvæ of *P. moneta* are beginning already to feed in gardens. I took three larvæ this morning, in the garden, in this road; they were in the tops of the new shoots of the monkshood, under a sunny fence. Last year I was successful in rearing to the imago five larvæ which I found in the same place, but the larvæ this year are nearly as large in March as they were at the beginning of May last year.—Ed. G. J. Sparke; Christchurch Villas, Tooting Beck, S.W., March 26th, 1903.

Hesperia (Syrichthus) malvæ var. taras in Sussex.—On or about June 15th last year I took, at Hailsham, a fine example of the form of *H. malvæ* in which the usual white markings are confluent. The form is figured in Newman's 'British Butterflies' as *Hesperia lavateræ*. —J. B. Browne; 43, Southbrook Road, Lee, S.E.

Rearing Ennomos erosaria and E. fuscantaria.—I too, like Mr. Oldaker (*ante*, p. 29), reared *Ennomos erosaria* and *E. fuscantaria* during the last season, but my experience has been very different from his. I "sleeved" out my larvæ of both species before the first week, —*erosaria* on an oak in my garden, and *fuscantaria* on an ash in the neighbouring park,—taking care in the latter case to put the sleeve sufficiently high to be out of the reach of cattle. Of the *erosaria* I should think at least eighty per cent. attained the perfect state, coming out at the beginning of August, of full size, with hardly a cripple among them. *Fuscantaria* grew much more slowly, and I had not so large a percentage of moths, but those I did get were equal in size to what I have taken at large. I attribute my success to the sleeving, which I believe to be by far the best plan for all larvæ which do not enter the earth to pupate; and if Mr. Oldaker has not tried that plan, I would suggest that he should do so next time he has ova of these two or any other "thorns."—(Rev.) Chas. F. Thornewill; Calverhall Vicarage, Whitchurch, Salop, Jan. 7th, 1903.

SOCIETIES.

Entomological Society of London.—*February 4th*, 1903.—Professor E. B. Poulton, M.A., D.Sc., F.R.S. (President), in the chair.—The President announced that he had appointed the Rev. Canon Fowler, M.A., D.Sc., F.R.S., Professor Raphael Meldola, F.R.S., and Dr. David Sharp, M.A., F.R.S., F.L.S., as Vice-Presidents for the Session 1903–1904.—Mr. T. Ashton Lofthouse, of the Croft, Linthorpe, Middlesbrough, was elected a Fellow of the Society. — Dr. T. A. Chapman exhibited two male specimens of *Orina tristis* var. *smaragdina*, taken at Pino, Lago Maggiore, on May 30th, 1902, still alive; and living larvæ of *Crinopteryx familiella*, second generation, bred from the egg at Reigate, the parent moths having been taken at Cannes in February, 1901.—The Rev. F. D. Morice exhibited, with drawings of the abnormal parts, an hermaphrodite of *Eucera longicornis*, Linn., showing one female antenna normal, and one male antenna remarkably shortened and with the joints greatly dilated; the clypeus and labrum one half white (the male character), and the other half black as in the female. In the abdomen and legs the female character predominated, but one half of the apical segments and genitalia seemed to be male. In the discussion of hermaphroditism which followed, Dr. Sharp stated that Father Wasman had announced the discovery that in certain Diptera, parasites of Termites, the individual commences its imago life as a male, and ends as a female—a phenomenon entirely new to entomology, though paralleled in some other groups.—Mr. R. McLachlan, F.R.S., exhibited a living example of *Chrysopa vulgaris*, showing the manner in which this species, which is ordinarily bright green, assumes a brownish colour, the abdomen being often marked with reddish spots in hibernating individuals.—Mr. W. J. Lucas submitted specimens of *Miris calcaratus*, and some fruit of a grass, swept up together by Mr. W. J. Ashdown, on the canal side near Byfleet, on July 14th, 1902. The similarity of form and colouring constituted a probable case of protective resemblance.—Major Neville Manders exhibited two specimens of an undescribed species of *Atella* from Ceylon; and remarked that it was a very local insect, only found in the Nitre Cave district, one of the localities most remote from civilization in the island. It was probably a well-marked local race of *A. alcippe*, but easily distinguished from any known species of the genus by the apex of the fore wing being entirely black. — Mr. F. B. Jennings exhibited British specimens of two species of Hemiptera-Heteroptera, *viz.* two females of *Drymus pilipes*, Fieb., a rare species of the family Lygaeidæ, which were found among dead leaves on a hillside near Croydon in September, 1901; and the black aberration of *Miris lævigatus*, L., recorded by him in the E. M. M. for 1902. The species of *Miris* and the allied genus of Capsidæ, *Megalocerœa*, are ordinarily grass-green, or pale yellowish.

—Mr. H. J. Elwes, F.R.S., exhibited two cases of Arctic butterflies. The first contained specimens from a collection formed by Mr. David Hanbury on the Arctic coast of North America, in the region where the Parry expedition was lost. Of the butterflies observed—fifteen species in all—two had not been taken since they were first described by Curtis sixty years ago. Among them was *Colias boothii*. This species, in comparison with *Colias hecla*, Lef., is undoubtedly distinct in both sexes, but it is most remarkable that the male in colouration and markings appears to approximate more closely to the characters usual in the females of other members of the genus. The collection contained nothing new, but included the rare and curious *Argynnis improba*, Butler, hitherto taken only in Novaya Zembla; a remarkable aberration of *A. chariclea*, Schn., in which the black netting marks were resolved into smeared black lines; *A. pales*, for the first time from this region, precisely similar to the form taken on the east of the Lena river in Siberia; and *Cœnonympha tiphon* closely resembling the form from Kamtschatka. The second case contained specimens collected by a Russian between Jakutsk and Verchojansk in north-eastern Siberia at about the same latitude, 67°, as the preceding exhibit. They included many species which occur in the western palæarctic region, such as *Aporia cratægi*, *Triphysa phryne*, *Cœnonympha iphis*, *Argynnis selene*, *A. ino*, *Melitæa phœbe*, &c., and most remarkable of all *Neptis lucilla*. Also *Parnassius delius*, which Mr. Elwes said was the first *Parnassius* he had seen from within the Arctic circle, and *Colias viluiensis*, Mén., an insect peculiar to Siberia, showing remarkable female aberrant forms.—Mr. C. O. Waterhouse gave an account of a nest of a bee, *Trigona collina*, recently received from Malacca. Specimens were exhibited, as were also males and a worker of the much smaller species, *Trigona ruficornis*, Smith, received at the same time from Singapore, and sent by Mr. H. N. Ridley.—Mr. W. J. Kaye exhibited two drawers containing Danaine, Ithomiine, and Heliconine species from British Guiana, all of similar colouration, and forming a Müllerian association with a black hind wing. A diagrammatic table was shown with the exhibit, which included the following species:—Ithomiinæ, *Melinæa crameri*, *M. mneme*, *M. egina*, *M.* n. sp., *Ceratinia veritabilis*, *C.* sp., *Mechanitis doryssus;* Danainæ, *Lycorea ceres*, *L. pasinuntia;* Heliconinæ, *Heliconius vetustus*, *H. namata*, *H. sylvana*, *Eueides* n. sp.; and Erycinidæ, *Stalachtis calliope*.—The following papers were communicated:—"On the Hypsid Genus *Deilemera*, Hübner," by Colonel Charles Swinhoe, M.A., F.L.S. "An Account of a Collection of Rhopalocera made in the Anambara Creek in Nigeria, West Africa," by Mr. P. J. Lathy. "Some Notes on the Habits of *Nanophyes durieui*, Lucas, as observed in Central Spain by Mr. G. C. Champion, F.Z.S., and Dr. T. A. Chapman, M.D., F.Z.S., with a description of the larva and pupa by Dr. T. A. Chapman."—H. Rowland-Brown, *Hon. Sec.*

South London Entomological and Natural History Society.—*January 8th*, 1908.—Mr. F. Noad Clark, President, in the chair.—Mr. Oldaker, of Dorking; Mr. Spitzby, of Canonbury; Mr. Priske, of Acton; Mr. Pratt, of Richmond; and Mr. Goulton, of Balham, were elected members.—Mr. Goulton exhibited an extreme form of the light-coloured Folkestone race of *Ematurga atomaria*.—Mr. Chittenden, a short series of *Ephyra pendularia*, including very fine examples of the rosy form, v. *subroseata*, from Staffordshire; very pale examples from Chislehurst, and light-banded forms from Ashford.—Mr. Lucas, on behalf of Mr. Kemp, an aberration of *Enallagma cyathigerum* with one stigma missing.—Mr. Kemp, a collection of the genus *Donacia*, comprising sixteen species. He called particular attention to the great variation shown by *D. discolor*, and pointed out the empty cocoon which clearly showed the small perforation which communicates with the intercellular air-spaces of the root to which it is attached.—Mr. Kaye, examples of *Amorpha austauti* and *Smerinthus atlanticus* from N. Africa, together with the exceedingly rare hybrid, *metis*, the produce of *A. austauti*, male, and *S. atlanticus*, female. He also showed the hybrid, *hybridus*, the produce of *S. ocellatus*, male, and *A. populi*, female.—Mr. Adkin read the Report of the Field Meeting held at Otford, Kent, on June 21st, 1902.—Mr. Step read the Report of the Field Meeting held at Byfleet on July 19th, 1902.—A large number of slides were exhibited by Messrs. Step, Lucas, Dennis, Tonge, Cant, Kaye, and Clark, comprising illustrations of protective resemblance in insects, studies of wild flowers, flowering and fruiting habits of our more common trees, ova of Lepidoptera, and special collecting spots. Mr. Kaye's slides were from photographs taken during his tour in British Guiana.

Annual Meeting.—January 22nd.—Mr. F. Noad Clark, President, in the chair.—The early part of the meeting was devoted to receiving the Report of the Council and Officers for the past year, the election of Officers and Council for the coming year, and the reading of the President's Address.—The following is a list of Officers and Council elected for the Session 1903–4:—President, E. Step, F.L.S.; Vice-Presidents, F. Noad Clark and J. H. Carpenter, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Hon. Curator, W. West; Hon. Librarian, H. A. Sauzé; Hon. Secretaries, S. Edwards, F.L.S., and H. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., T. A. Chapman, M.D., H. T. Fremlin, F.E.S., A. Harrison, F.L.S., G. W. Kirkaldy, F.E.S., W. J. Lucas, B.A., and H. Main, B.Sc.—Mr. Hy. J. Turner exhibited specimens of *Sympetrum sanguineum* from the Black pond, Esher, and from Staples pond, Loughton, both being new localities. He also showed *Papilio macrosilaus* and *P. philolaus* from S. America.

February 12th.—Mr. E. Step, F.L.S., President, in the chair.—Mr. Barnett exhibited a very lightly marked specimen of *Ematurga atomaria*, and a very pale example of *Tephrosia luridata* (*extersaria*), both from W. Wickham woods.—Mr. Hy. J. Turner (1) *Erasmia pulchella*, a Chalcosid moth, and one of the most brilliantly coloured of the Lepidoptera; *Campylotes histrionicus*, another species of the same family; and *Areas galactina*, an Arctiid, all from Darjeeling. (2) Specimens of *Abraxas sylvata* (*ulmata*) from Amersham, Bucks, and from Assam, almost identical in tint and markings. (3) On behalf of Mr. Day, of Carlisle, a box of local Coleoptera, consisting of some three dozen species, and including *Hydrothassa hannoverana*, *Omalium septemtrionis*, *Agabus congener*, *Stenus guynemeri*, *Hydroporus pictus*, *H. incognitus*, &c. (4) A box chiefly of Pyralidæ from Assam, including representatives of some twenty-five genera.—Mr. Enock gave a lantern demonstration dealing chiefly with details of the transformations of the dragonfly, *Brachytron pratense*, and the butterfly, *Gonepteryx rhamni*.—Hy. J. Turner, *Hon. Rep. Sec.*

EXCHANGE.

Duplicates. — Pulveraria,* Advenaria,* Repandata* (dark), Templi (fair), Hastata (fine), Cæsiata, Inornata* and larvæ, Chrysorrhœa,* Viminalis var. Obscura,* Palpina,* Heparata, Illustraria,* Cinxia,* Albicillata, Ambigua (fair), Ribesiaria=(Prunata),* Fluctuosa (fair), Actæon, Menthastri var. Ochracea var. Carbonica,* Lubricipeda var. Radiata,* all forms (including black-bordered). *Desiderata.*—Iris, Holosericata, Irriguata, Constrictaria, Valerianata, Quadrifasciaria, Dodonæa, Putrescens, Caliginosa, Semibrunnea, &c.—*John Harrison; 7, Gawber Road, Barnsley.*

Duplicates. — A fine lot of well-set imagos on black pins. *Desiderata.*—Pupæ of Chaonia, Dodonæa, Dictæoides, Trepida, D. Furcula and Bifida, and other pupæ; larvæ of Dominula and Villica; ova of Io (or live females), Notha, Populeti, and many other good species. Exchange given.—*Thos. Salvage; Arlington, Berwick, Sussex.*

Duplicates. — S. Populi, Tiliæ, Vinula, Potatoria, Salicis, Quercifolia (2), Jacobæa, Impura, Festiva, C-Nigrum, Pistacina, Vaccinii, Exclamationis, Xanthographa, Oculea, Fulvago,* Flavago,* Circellaris, Graminis, Geniculeus (6), Testata, Didymata, Bicolorata (6), Sordidata, Ochrearia (6), Tenuiata, Gentiana, Variegana, Sponsana, Comparana, Paykulliana, Angustiorana, Unifasciana, Reliquana, Pyrella, Padellus, Porrectella, Costosa, Alchemiella. *Desiderata.* — Monacha, Antiqua (male), P. Populi, Aceris, L. Comma, Putris, Rurea, Hepatica, Basilinea, Gemina, Arcuosa, Haworthii, Vestigialis, Puta, Corticea, Nigricans, Tritici, Strigula, Augur, Triangulum, Stigmatica, Brunnea, Rubi, Castanea, Pulverulenta, Satellitia.—*Archdale Sharpin; 28, Kimbolton Road, Bedford.*

Duplicates.—Bred: Castrensis, Camelina, Anachoreta, Illustraria, Croceago (3), Angularia, Autumnaria, W-Album, Polychloros, &c. *Desiderata.*—Ova, larvæ, or pupæ of Prodromaria, T. Cratægi, Prunata, Dotata, Suffumata, Chrysitis, Lunaria, Bajularia, Orbicularia, Alternata, Subumbrata, Parthenias, Trisignata, Pimpinellata, Assimilata, Sexalata, Hastata, Dodoneata, Amataria, &c. Accepted offers answered by return.—*Colonel Partridge; 72, St. John's Park, Blackheath, S.E.*

Lepidoptera.—Will exchange Japanese Lepidoptera, in papers, for Foreign Lepidoptera.—*T. Z. Takano; 67, Shichome Honcho, Yokohama, Japan.*

Duplicates. — Z. Annulata vars. Obsoleta and Biobsoleta and intermediates. *Desiderata.*—Offers.—*W. S. Riding; Buckerell Lodge, near Honiton, E. Devon.*

Duplicates. — Ova of Versicolor, Tiliaria, and Autumnaria. *Desiderata.* — Numerous, especially Eupithecia. — *V. E. Shaw; 8, Moss Hall Grove, North Finchley.*

Duplicates.—Davus, Erosaria,* Cervinaria.* *Desiderata.*—Ova, larvæ, or pupæ of many species. Accepted offers answered within a week.—(*Rev.*) *Chas. F. Thornewill; Calverhall Vicarage, Whitchurch, Salop.*

Duplicates.—Chrysorrhœa* (fine), Æscularia,* Strataria ova (dark strain), Pedaria ova, Dispar, O. ova. *Desiderata.*—Hispidaria, Syringaria, Lunaria, and Pennaria. Early stages preferred.—*Alfred J. Willsdon; 28, Albany Road, Manor Park, E.*

CHANGES OF ADDRESS.—H. W. Andrews, *from* 9, Victoria Road, Eltham, *to* Mafeking, Welling, Kent. A. Harrison, Delamere, Grove Road, South Woodford, Essex. H. Main, Almondale, Buckingham Road, South Woodford, Essex.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON (11, Chandos Street, Cavendish Square, W.).—Wednesday, April 1st, 1903, at 8 p.m. Papers to be read:—1. "Contributions towards the Life-history of *Orina* (*Chrysochloa*) *tristis* var. *Smaragdina*," by T. A. CHAPMAN, M.D., F.Z.S. 2. "Notes on the Crabronidæ," by FREDERICK ENOCH, F.L.S. 3. "The Life-history of *Cicendela campestris*," by FREDERICK ENOCH, F.L.S.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY (Hibernia Chambers, London Bridge, S.E.).—Meetings on the 2nd and 4th *Thursdays* in each month at 8 p.m.

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A NEW SPECIES OF *CALLITHEA* FROM PERU.

By Percy I. Lathy, F.E.S.

Plate II.

Callithea adamsi, sp. nov.

Upper side:—Fore wing shining purplish blue, deepening to black on lower discal area, a marginal green border slightly tinged with gold, this border widest on costa; apex and upper part of outer margin dark green. Hind wing shining purplish blue, costa and inner margin blackish, a marginal green border slightly tinged with gold, this border widest at anal angle. Under side:—Fore wing green tinged with gold, inner margin and lower discal area blackish, a basal orange patch not extending so far in cell as on costa and inner margin; four submarginal black spots between upper discoidal and lower median nervules; of these the two lower are the larger. Hind wing green tinged with gold, a large basal orange patch, beyond this four rows of black markings, the first just beyond cell being incomplete, the spot below costal nervure and that beyond cell being best defined; the next row is composed of large equal-sized spots, with the exception of the two next the inner margin, which are not so wide as the others; the third row contains smaller spots, the two next inner margin being again smaller than the others; in the fourth row the markings are small and linear. Cilia of both wings white above and below. Exp. 62–70 millim.

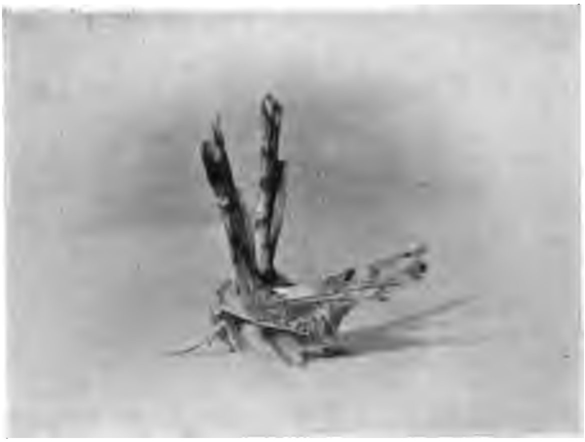
Hab. Perené, Peru. 4000 ft. In Coll. H. J. Adams. Fifteen males, including type.

Mr. H. Watkins, my collector in Peru, has been fortunate enough to obtain a good series of males of this very beautiful new species. The female yet remains to be discovered. *C. adamsi* is allied to *C. degandii*, Hew., *C. srnkai*, Hew., and *C. bartletti*, Godm. nd Salv.; it may however be at once distinguished from all these pecies by the restricted basal orange area of the hind wings below; in the three above-mentioned species the orange extends o beyond cell, and adjoins the inner row of black markings. In

C. adamsi the orange does not reach end of cell, and is well separated from the first row of markings; also, in the new species, the inner and outer series of markings are not nearly so well defined as in *C. degandii* and its allies.

NOTES ON THE RESTING ATTITUDE OF *ZAMACRA FLABELLARIA.*

By Miss D. M. A. Bate.



While making a small collection of moths in Cyprus, several specimens were obtained near Limassol of *Zamacra flabellaria,* one of the Geometridæ. When displayed in the drawer of a cabinet it would most probably be passed over by the uninitiated as an uninteresting-looking moth marked with several shades of brown, apparently its only claim to notice being the possession by the male of large and feathery antennæ. However, when seen alive and at rest, one is immediately struck by the remarkable peculiarity of the position it assumes. As may be seen in the accompanying photograph, which represents the male insect slightly larger than its actual size, the fore wings are held erect almost vertically above the thorax, and at the same time each is folded much in the way that a fan is closed. The under wings are also folded, but to a smaller extent, and are only slightly raised above the body, the hinder end of which is also raised, reminding one of the manner in which a woodcock holds its tail while squatting on the ground. The antennæ, at the same time, lie close along the sides of the body.

This moth flies at night, often coming into houses, attracted, as usual, by the lamplight. One caught at night and covered with a tumbler was found in the morning to be still in this characteristic position, thus making it possible for its photograph to be taken.

This species is an inhabitant of countries washed by the Mediterranean, being found in Greece, Syria, and Morocco, as well as in the islands of Sardinia, Sicily, and Cyprus. In general appearance the Cypriote specimens are slightly darker than those from other localities in the collection of the British Museum.

This moth was originally described by Herr Heeger in 1838 as *Amphidasis flabellaria* ('Beiträge Schmetterlingskunde,' p. 6, Wien, 1838), when he mentions its peculiar method of folding its wings like a fan, on which account he gave it the name of *flabellaria*. He also gives a figure of it at rest, but this does not convey a very good idea of the position, for the wings are depicted as much more loosely folded, and the hinder pair less closely held against the body than appears in the photograph. Writing of it in 1860 (Ann. Soc. Ent. France, t. 8^{me}, Paris, 1860), M. Bellier de la Chavignerie compares its position when in repose to that of some of the Ptérophores, or plume moths.

Apparently the only other moths noticed as folding their wings in any way approaching the manner of *Z. flabellaria* belong to quite distinct groups, and are very much smaller, with the exception of the angle shades. These roll up their wings, but hold them in a normal position, while the moths of the genus *Gathynia*, included in the family Epiplemidæ, fold their wings and spread them out in the form of a cross. In the third volume of 'The Fauna of British India' Sir George Hampson writes of this genus, which is found in India and Ceylon, that "the species repose in the form of a cross, with the fore wings rolled up at right angles to the body, the hind wings folded close to the body." From this description it will be seen that the resemblance lies chiefly in the fact that each has a peculiar method of folding the wings, and that here the likeness ends, for in one the fore wings are held vertically, and in the other horizontally. Hence this peculiarity has evidently been independently arrived at, and it seems natural to conclude that there must be considerable advantage to be gained by its adoption. However, without knowing the details of its life and habits, it is difficult to imagine how this attitude could be of any particular use or protection, unless, as Mr. Frohawk suggests, the moth is in the habit of settling on the trunks or branches of trees, in which case the narrow folded wings would closely resemble a loosened piece of bark or a broken twig.

SOME BRITISH FORMS OF *MELITÆA AURINIA.*

By Percy E. Freke, F.E.S.

(Concluded from p. 89.)

Var. *artemis* (Fab.).—In this form the whole of the ground colour is from pale fulvous to brownish fulvous, with the exception of the outer row of (semilunar) spots on the hind wings, which are lighter. The dark markings which form the boundary lines, reticulations, and base of the wing, are scarcely so much developed perhaps as in the type, certainly not more so. The chief variation of the pure form seems to be in the more brown or red tint of the fulvous, although (except in East Kent) variation towards the colouring of the type is common, first showing in an ochreous tendency of the first band of the fore wings, from which every graduation up to the type (*aurinia*) may be found.

In its most pronounced form I believe this variety occurs in eastern England (Kent), south-west England, and South Wales, especially the first, where I have found it less inclined to vary from its local type than those from other localities. I have, however, no specimens from northern England, Scotland, or Ireland that I could refer to it.

Var. *præclara*, Kane.—Mr. Kane, in treating of this species ('Entomologist,' 1893), describes this variety as having "the red and central pale series very vivid in colour, and the black reticulations darker than the type. Ground colour black, strongly and broadly marked, defining the colour blotches sharply, but not reducing them in colour or size. These are of a brilliant terra cotta tint, but the central transverse series (double on the fore wing) are of bright straw colour."

In comparison with the type, the most striking characters of the variety are, that the ochreous colouring is now a pale straw colour, which contrasts very strongly with the blacker tone of the dark markings. The fulvous red is also perhaps somewhat brighter. This is the prevalent form in Ireland. All my Irish specimens, from several localities, are, with very few exceptions, more or less stamped with the characters of this form. One or two individuals from Kildare alone could be said to be really of the *aurinia* type. The highest development of this variety which I have are from Westmeath, many of them being extremely strong contrasts of black and whitish-straw colour, even the space between the costal margin and the costal nervure being sometimes very light.

Mr. Tutt, in his 'British Butterflies,' says, "We have specimens labelled Delamere Forest." I have never myself seen any English specimens that could be referred to this form. Its variation seems to be towards the type on one side and towards var. *scotica* on the other. It is the direct opposite of var. *artemis*, which I have never found in Ireland. The black spots in the fulvous second row of the hind wing are sometimes surrounded with ochreous. This occasionally occurs to a slight extent in the type also. The black spots are sometimes completely absent, giving a peculiarly red aspect to the hind wing.

Ab. *virgata* (Tutt).—"The central straw-coloured band of the fore wings is normally divided at the top by a black streak. This is sometimes absent, the two series are united, and the band is broad and very conspicuous." (Tutt, 'Brit. Butterflies,' p. 317.) This aberration is not very uncommon in Irish specimens. I have some from Westmeath in which it is carried to an extreme extent. One, a male, has no red, except on the second row of the hind wings. The first row white and large, the inner white spot conspicuous, otherwise the inner half of the hind wing is black. In the fore wing, the usual fulvous markings are almost white. The base of the wing is whitish, almost to the body, with a dull dark spot across the centre, and on the hind margin of the discoidal cell. A dull, rather faint streak of dark colour passes from the middle of the inner side of the discoidal cell to the first nervure. The pale spots of the first band are confluent and much extended, occupying almost the whole central portion of the wing to the first nervure; even the usual dark space between this and the inner margin is nearly white. In other specimens the whitish first band is confluent and much extended, and forms a broad whitish blotch across the wing to the first nervure, but the base of the wing is always dark, and there is always some reddish tint in the second row of the fore wing.

The direct opposite of this aberration is found where the dark areas are very black, and so much extended as to greatly reduce, and even often obliterate, many of the other markings. The relationship to var. *virgata* is shown in the suppression of the fulvous colouring, giving the specimens a black and white appearance, but here the black colour predominates instead of the whitish. In some males that I have from Westmeath, the basal half of the fore wing is black, but sometimes a small white spot is visible near the centre of the discoidal cell. A more distinct one always appears at the hind margin of the cell. The first row is much reduced in size, and is of a clear whitish colour. The second row small, white, with a slight trace of pale fulvous at the hind margin of the spots. Throughout the whole wing the black is much extended, diminishing the other markings. The hind wing is black to the first row, which is small but distinctly whitish. In the second row the spots are small, but the fulvous colour undimmed, and there is always some trace of the whitish third row, as small distinct spots in the wide black marginal band.

In some females this effect is carried still further. The whitish markings are more reduced in size, the inner series of the double first row being sometimes almost obliterated. With the exception of a white spot at the hind margin of the discoidal cell, and another just inside it, the wing is quite black to the first row, which, being small, extends the black almost to two-thirds of the wing. The fulvous in the fore wing is represented only by a trace along the outer edge of the second row. In the hind wing the black practically extends to the fulvous second row, the first row being only represented by a string of small white spots. Most of the specimens are of small or moderate size. I think this form might fairly be called ab. *nigra*.

Var. *scotica* (Robson).—Similar to the last aberration in the extension of the dark marking, but the whitish is much duller, and is often replaced by reddish ochreous, which makes a very handsome variety, having an appearance which might be termed black and tan or tortoiseshell.

Mr. Kane ('Entomologist,' 1893) says of it: "The straw-coloured patches are of a duller tone than those of the preceding variety [*praeclara*]. The fulvous submarginal band of the fore wing is suffused centrally with yellowish, but that of the hind wing usually retains its normal colour and size." He says of the black colour: "Filling the basal area of all the wings up to the fulvous discoidal patch in the fore wing, and the pale central series of the hind wing, the pale discoidal spot of which, however, is usually retained."

The only specimens I have of this form are from Westmeath and Kildare. It was named, I believe, from specimens from Aberdeen, but I have never seen the types.

Ab. *hibernica* (Birchall).—In the 'Entomologist,' 1893, Mr. Kane gives a translation of Birchall's description. Male. Wings above black. Fore wings ornamented with fulvous patches arranged in a series near the hind margin, with a number of others in the middle white or whitish straw-coloured, joined at the inner margin, forming a blotch. The hind wings with a broad fulvous fascia along the hind margin (the fulvous marks on the narrow black outer margin of examples of the type being indistinct or obsolete in the variety.) Beneath pale fulvous, with similar, but indistinct, pattern.

Female:—Fore wings fulvous, marked with a double row of white or pale straw-coloured patches, sometimes confluent, and forming fasciæ, with the outer band carried on across the hind wings. Hind wings as in the typical form, but ornamented with neither pale straw colour nor fulvous patches.

I presume this dark condition is intended to refer only to the basal part of the wing. I have never seen a specimen of this species of any variety—even var. *merope*—that had not some red on the hind wings. Large size is also given as a characteristic of this aberration.

Mr. Kane says that Irish examples of var. *scotica* usually pass muster as var. *hibernica*. This aberration is supposed only to have been found near Rathowen, in Westmeath.

Var. *provincialis* (Boisd.).—Mr. Tutt says, "An almost unicolorous, fulvous form (except the marginal series of paler spots on the hind wings), with the transverse lines somewhat obsolete." He mentions examples of it from Penarth and Lincolnshire. I have only continental specimens. In the females especially, the great suppression of the dark markings is remarkable, the hind margin of the hind wing retaining it most. The ochreous spots are redder than usual, and approach in colour to the rather light and bright fulvous of the other markings. This, with the great reduction of the transverse lines, give the insects a generally concolorous appearance, which is in striking contrast to the much broken-up, tessellated aspect of the type (*aurinia*).

Var. *merope* (Prun.).—A dull, dingy form. The red and yellowish markings in the usual places, but much dimmed, and the size of many of the normally larger spots reduced, so that there is not so much difference between them and those in the smaller row. The dark marking also is dull and hazy. Size small. Mr. Tutt includes this among the British varieties, on the strength of some specimens approaching it in the colouration of the upper side, bred by the Rev. J. S. St. John. I have only European specimens from the Alps, but one small female from Westmeath fairly approaches *merope* on the upper side. The dark markings, however, are blacker, and the fulvous (second) band on the hind wing larger and somewhat brighter. Nor does the under side correspond with var. *merope*.

As far as my limited experience goes, it appears to me that our British forms of the species may be divided primarily into three leading varieties: *aurinia* (Rott.), *artemis* (Fab.), and *præclara* (Kane). Besides these we may perhaps include *brunnea*, of which I know nothing, and *provincialis*, of which, as a British variety, I have no experience. But *signifera* (Kane) seems to me to be only one of the many transitional forms, and not a leading variety, and *merope* I cannot regard as British.

The first (*aurinia*) seems in Great Britain to be the more northern form, also the one which, in most other localities, is apt to appear among the local variety, and more or less to influence it. Thus we find in the southern part of England and Wales, and in Ireland, individuals which might fairly be called *aurinia*, or a more or less close approach to it, appearing among those which we must refer to the local variety; but even these last are very variable, and many of them show more or less traces of the *aurinia* form.

Variation in this leading variety is from the extreme dark northern form (*scotica*) to the type, and through innumerable transitions inclining towards one or other of the other two leading varieties. *Scotica* (Robson) appears to me to be but a form of this leading variety, and corresponds with the dark form of *præclara*, which I have here spoken of as *nigra*.

Var. *artemis* seems to be confined with us to southern England and South Wales. I have seen no northern English or Scotch specimens that I could refer to it, and I have never seen anything approaching it from Ireland. It seems to vary towards *aurinia* only.

Var. *præclara* is the Irish form, and appears to be confined to that country as far as I know. It varies from *aurinia*, through many phases, to the extreme forms *virgata* and *nigra*. The latter corresponds to the *scotica* form of *aurinia*, and in these the two leading varieties approach each other, the chief difference being, that that of *præclara* always retains the light markings very whitish, no matter how much they may be reduced by the extension of the black parts.

A NEW COCCID OF THE GENUS *ASTEROLECANIUM* FROM EGYPT.

By T. D. A. Cockerell.

Asterolecanium pustulans (Ckll.) var. *sambuci*, n. var.

♀. Scale about 1⅛ mm. diameter, almost circular, slightly convex, pale yellow, with a rather long dense very pale pinkish fringe.

♀. Mouth-parts brownish, diameter about 60 μ; scattered large figure-of-eight (double) glands in the skin, diameter of a gland 12 μ; margin with two rows of simple glands and one row of double, the simple glands at intervals of about 9 μ, the double glands about 9 μ diameter and 8 (rarely 6) μ apart.

Hab. On bark of *Sambucus*, not producing pits. Le Caire (Cairo) Egypt; received from Dr. P. Marchal, who received it from M. Vayssière. The scale is quite like that of *A. pustulans*, there is practically no external difference. The double glands of the margin are larger and very much closer together than in *A. pustulans*. The species of *Asterolecanium* differ in the arrangement of the marginal glands. In some species (as *A. fimbriatum*, *A. ventruosum*, *A. algeriense*, and *A. viridulum*) there are two rows of double glands; in others (as *A. pustulans*, *A. townsendi*, *A. ilicis*, *A. ilicicola*, and *A. petrophilæ*) there is only one row.

A. pustulans sambuci is very likely a valid species, but it is so near to *pustulans* that I treat it as a variety for the present. It can be distinguished from *A. ilicis* by the fringe, and the double glands of the margin being close together. *A. ilicicola* occurs on leaves, and has only one row of simple glands.

East Las Vegas, New Mexico, U.S.A.: Jan. 6, 1903.

UPON MATERNAL SOLICITUDE IN RHYNCHOTA AND OTHER NON-SOCIAL INSECTS.

By G. W. Kirkaldy.

Since my brief note on this subject (Entom. 1902, vol. xxxv. pp. 319–20) I have seen a lengthy paper by the celebrated J. H. Fabre [5]* on "Pentatomas," in which he ridicules De Geer's account, and consigns the whole recital to the limbo of fairy tales.

I have therefore looked up the literature of the subject, and have now summarized it, in the hope that some of the readers of 'The Entomologist' may be disposed to give the phenomena their attention during the ensuing months.

(a) Orders other than Rhynchota.

The earliest reference to parental care in non-social insects appears to be that of Goedaert [9], who states that the mole-crickets (*Gryllotalpa gryllotalpa* (Linn.)) take particular care of their eggs, raising up the nests in a hot and dry season so that the young almost touch the surface of the earth, and are thereby cherished by the sun's heat; contrariwise they sink the nests down when the air is cold and moist. They also act as unceasing sentinels round the nest. Rösel [22] cites the above account, and gives a coloured sectional drawing of the nest and eggs. Audouin [1] states that all authors agree in saying that the mole-cricket takes the greatest care of its young, but Goedaert is the only author I can trace who relates his personal observations.

The discovery of the maternal solicitude of the earwig (*Forficula auricularia*, Linné) by Frisch [6], confirmed and extended by DeGeer [8], Rennie [21], Kirby and Spence [14], Camerano [4], &c., is so well known and authentically established by recent observations, that it is not necessary to dwell upon it. Sharp [23] states that *Labidura riparia* "is said to move its eggs from place to place, so as to keep them in situations favourable for their development," but I have not been able to trace the original source of this statement. Burr [3] also notes that "a certain entomologist" (Col. Bingham) "once told me that in Burmah, while sitting round the camp fire one night, they disturbed a large earwig who was guarding a little batch of eggs. Her first care was not for herself, but for her eggs. She showed great concern for their safety."

In the Hymenoptera, I do not refer to the well-authenticated instances of maternal providence in the Sphegidæ and other families, this notice being confined to actual personal and continuous care. A summary of the former will be found in Sharp [24], p. 111. Of the latter there is one instance, viz. *Perga lewisii*, Westwood, a Tasmanian sawfly. The habits of this Tenthredinid were related [16 and 17] by R. H. Lewis, who informs us that the eggs, in number about eighty, are placed transversely in a longitudinal incision between the two surfaces of a leaf of a species of *Eucalyptus*. On this leaf the mother sits till the eggs are hatched. She follows the larvæ, "sitting with outstretched legs over her brood, preserving them from the heat of the sun, and protecting them from the attacks of parasites and other enemies." It should be noted, however, that broods accidentally or purposely deprived of the mother appeared to thrive just as well. These observations have been briefly confirmed by Froggatt [7].

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* These numbers refer to the bibliography at the close of the paper.

In the Coleoptera, the only instances known to me occur in the Scolytidæ, among the Ambrosia beetles, and a consideration of these scarcely comes within the scope of this notice, since they are not non-social insects. The reader may be referred to Kirby and Spence [14] and Hubbard [25].

Mr. R. South and Mr. L. B. Prout are not aware of any instance among the Lepidoptera, and similar advice has been given me by Mr. G. H. Verrall and Mr. J. E. Collin of the Diptera, and by Mr. W. J. Lucas of the Neuroptera. Research on the literature of the Thysanoptera, Anoplura, Thysanura, &c., has failed to trace any such records.

I must here also express my thanks to Messrs. W. F. H. Blandford, C. O. Waterhouse, C. J. Gahan, W. F. Kirby, and Drs. G. Breddin and D. Sharp, for information and hints.

Rhynchota.

The earliest Rhynchotal notice is that of Modeer [18]. In speaking of "*Cimex ovatus pallide griseus*," he distinctly affirms that the eggs are laid in June on the common birch, in number from forty to fifty, so that the mother can cover them when she sits over them. She does not abandon them except for brief refreshment, and cannot be removed except by superior force. The eggs are hatched at the end of June, and the maternal care is still exercised, for she protects them against the male, whose attacks and the defence of the mother are circumstantially related. The great De Geer [8] confirms and expands the observations under the head of *Cimex betulæ* (he gives *C. griseus*, Linné, as a synonym !). Boitard [2], in his 'Curiosités d'Histoire naturelle'—a work unknown to me—embellishes these accounts, according to Fabre [5], by noting that when it rains the mother leads her young under a leaf or under the fork of a branch to shelter them, and covers them with her wings. Montrouzier [19] observed the habits of Oceanian Scutellerinæ, a subfamily not closely allied to the Acanthosomatinæ (in which the birch bug is included). His remarks have been recently translated in 'The Entomologist' [15]. Montrouzier appears to have been unaware of the researches of Modeer and De Geer. Douglas and Scott [20] quote a letter addressed to the former by E. Parfitt, enclosing an adult female and young ones identified as "*Acanthosoma griseum.*" This letter circumstantially verifies De Geer's observations, which, so Parfitt states, were unknown to the English entomologist. These habits were still further confirmed in great detail, in three notices [10, 11, and 12], by Hellins, a well-known and most careful observer.

Last year I contributed to 'The Entomologist' [15] a translation of Montrouzier's observations [19], and noted "a species of *Spudæus* (?)" sent by Dr. Willey from Birara (New Britain), of which I had under my care for study alcoholic specimens apparently confirming the generally accepted opinion. These specimens belong to the Pentatomine *Coctoteris exiguus*, Distant, a determination kindly confirmed for me by the author of the specific name.

So far the five original observers, *viz.* Modeer, De Geer, Montrouzier, Parfitt, and Hellins, agree that the female bug does show parental affection during a comparatively considerable period, and the first-named declares that this is, in part at least, directed against the assaults of the male; but in 1901 J. H. Fabre, the "immortal Fabre" of Darwin, and one of the foremost of modern field observers, has published a lengthy document [5], in which he declares De Geer* to be mistaken. The gist of Fabre's paper is as follows: The grey bug† is rare in Fabre's neighbourhood; he found three or four specimens which he placed under a bell-jar, but they did not oviposit, though eggs were laid by the green [= *Palomena prasinus* (Linné)], red- and black-speckled [= *Eurydema ornatus* (Linné)], and yellowish [sp. ?] ‡; and Fabre continues, "In species so closely allied, parental care in one ought, at least in some details, to be discovered also in the others." It cannot be too strongly expressed that the last three are not at all closely related to the grey bug, for the last-named belongs to the Acanthosomatinæ, the other three to the Pentatominæ, subfamilies distinguished apart by considerable and important structural differences. Fabre declares that in these species "the mother paid no attention to her brood; the last egg laid in its place at the extreme end of the final row, she left, careless of the trust; she no longer busied herself with it, and returned no more. If the chances of roaming bring her back, she walks over the heap and passes on indifferent. . . . This forgetfulness must not be considered as a possible aberration due to captivity. In the full freedom of the fields I have discovered diverse broods, among which are found, perhaps, that of the grey bug; never have I seen the mother mounted over her eggs, as she ought to, if her family required protection as soon as hatched. The mother is of roving inclination and facile flight; once flown far from the leaf which received the treasure, how, two or three weeks later, will she remember that the hour of exclusion approaches? How will she rediscover her eggs, and how again distinguish them from those of another mother? It would be incredible, such prowess of memory amid the immensity of the fields.

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* The Swedish master and Boitard are the only authors mentioned by Fabre, and he appears to be unaware of the independent observations of Montrouzier, Parfitt, and Hellins.

† *Elasmostethus griseus* (Linné) = *Acanthosoma interstinctum* of Saunders's 'Hemiptera Heteroptera of the British Isles.'

‡ Fabre calls these all "*Pentatoma.*"

"Never, I say, is a mother surprised stationary near the eggs that she has fixed on a leaf, and, more convincing still, the total brood is divided into clutches scattered haphazard, so that the family in its entirety is formed of a number of tribes lodged here, there, and at distances sometimes considerable, but impossible to fix precisely. To rediscover these tribes at time of hatching, earlier or later according to the date of oviposition or the forwardness of the season, and then to reassemble in one flock from the four corners of the universe all the little ones, so feeble and moving so unsteadily—there are in this evident impossibilities. Suppose that by chance one of the groups is discovered and recognized, and that the mother devotes herself to them. The others must in that case be abandoned—and they do not prosper the less. What then is the motive for this remarkable maternal zeal with regard to the care of one of the groups when the majority are left? Such singularities inspire mistrust!

"De Geer mentions groups of twenty. These would certainly not be the complete family, but just a tribe resultant from a partial oviposition. A Pentatoma, smaller than the grey bug, has given me in a single batch more than a hundred eggs. A like fecundity ought to be the general rule when the mode of living is the same. Beyond the twenty observed, what became of the others abandoned to themselves?

"Despite the respect due to the Swedish savant, the caresses of the mother-bug and the unnatural appetites of the father, devouring his little ones, ought to be relegated to the same limbo as the childish tales which encumber history. I have watched in an aviary (*volière*) as many hatchings as I wished; the parents were near at hand, under the same roof. What do they all do in the presence of the young? Nothing at all! The fathers do not dash to drain the juices of their brats! Neither do the mothers rush to protect them! One flits about the lattice-work (*treillis*) [? metal gauze], one settles down to refreshment at the rosemary, while another walks over the groups of newly-hatched youngsters, which he tumbles head over heels, without any bad intention, but without any discretion. The little beggars are so small, so feeble, that, passing by, he grazes them with the end of his foot and overturns them. Like turned turtles, they vainly kick about; no one heeds them. During three months' assiduous observations I have not noted the slightest appearance of the maternal solicitude so celebrated by the compilers. The newly hatched bugs, packed one against the other, remain stationary for several days on the empty eggs; there they acquire a firmer consistency and brighter colouring. Hunger comes; one of the youngsters leaves the group in search of refreshment; the others follow, happy in their mutual proximity, like sheep at pasturage; the first in moving sets in motion the whole band, who set out for tender places where they may implant their beaks and imbibe; then they all return to their natal place for repose upon the empty eggs. Expeditions in common are repeated over an increasing radius, till at last, somewhat strengthened, the society separates and breaks up, never to return to its place of birth. Henceforth each one lives in his own way. What, then, would happen if, when the troop moves away, there should encounter them a mother of slow gait, a frequent case among the sedate bugs? The young ones, I suppose, would confidently follow this chance leader, as they follow those among themselves who are the first to take to the road; there would then be some similarity to a hen at the head of her chickens; this casual occurrence would lend an appearance of maternal cares in a stranger heedless of her bundle of brats.

"The good De Geer appears to me to have been duped in some such manner: a little colour, involuntarily embellished, has completed the tableau; and then are vaunted in books the family virtues of the grey bug."

Fabre has been led into error, first by his ignorance of systematic Rhynchotology; as I have previously remarked, the form of bug which De Geer had under observation belongs to a subfamily not closely allied to that embracing the bugs watched by Fabre; secondly, by his negligence of previous literature, except that of De Geer (and incidentally Modeer) and Boitard; yet we have an independent observer, Montrouzier, ignorant, apparently, of all previous similar records, who notes a like habit in yet another subfamily, more remote still from either, and that almost at the antipodes of Europe. Moreover, De Geer's accounts are explicitly corroborated by two competent field entomologists whose integrity and capacity have never before been questioned, and one of these (Parfitt) was by his own account ignorant of any literature on the subject. So that Fabre's gibe at Messieurs the Compilers has failed to score. Boitard's account may perhaps be treated a little incredulously, and possibly also Modeer's interpretation of the paternal gymnastics.

In my opinion, at least, it will be necessary to have much more direct refutation of De Geer, Hellins, and Parfitt than the observations of even Fabre on species of another subfamily.

With regard to Fabre's asseveration that he never once found a female "Pentatoma" stationary near the eggs, this is circumstantially contradicted by the precise observations of Hellins and Parfitt in *Elasmostethus*. Neither has the French author proved his theory, upon which he establishes so large a part of his assumptions, that the Pentatomidæ (or at least some of them) oviposit in more than one place. It is to be regretted that he did not examine the oviducts of one of the females observed by him. Moreover, it does not appear that Fabre marked any of the female Pentatominæ observed by him, so as to recognize them in the event of any "chance" returns to the original spot. Fabre also says, "a Pentatoma smaller than the grey bug has given me in a single batch more than one hundred eggs," and insists therefore that De Geer's record of twenty in the grey bug could have been only a partial laying!!

This confines the subject entirely to the Rhynchota; now we have also, as noted above at the beginning of this paper, records of the devotion of the mother earwig (and of more species than one), records as well authenticated as such could well be, not only in written literature, but from living observers who have not considered it worth while to register what has always appeared as a thoroughly firmly founded fact. The occurrence in *Gryllotalpa gryllotalpa* seems also authentic, while the recent confirmation by Froggatt, after seventy years' interval, of Lewis's observations on *Perga lewisii* establishes this remarkable case beyond doubt, and it is especially interesting to note that in other Australian species of the same genus entirely different larval habits are known to obtain; the latter is another argument against Fabre. What is there of incredibility in the whole recital? What a limited demonstration of affection, or at least of intelligent power, compared with that displayed by the social Hymenoptera and Neuroptera! Fabre argues as if parental solicitude and the sense of direction were unknown among the Insecta, and his sneer at the inadequacy of the memory of the mother-bug to rediscover the original place of oviposition is remarkable enough from the historian of the habits of the Hymenoptera.

To conclude, Fabre may prove to be right, and Goedaert, Frisch, Modeer, De Geer, Kirby and Spence, Rennie, Montrouzier, Boitard, Lewis, Parfitt, Hellins, Camerano, Froggatt, and Bingham, all, to a man, wrong; but even if so, Fabre has proved nothing at present beyond the fact that the females of two or three species of Pentatominæ, not particularly closely observed by previous authors, did not manifest any regard for their progeny during his observations. It is perhaps not the "good

De Geer" who "has been duped" but Fabre, who has been led astray by his ignorance of the systematics and bibliography of the Rhynchota.

Bibliography of Original Papers, &c.

[1] 1835.—J. V. Audouin, Histoire naturelle des Insectes, ix. p. 196. (Quotes Goedaert on the mole-cricket.)

[2] (?).—P. Boitard, Curiosités d'Histoire naturelle. (This is cited on the authority of Fabre ; I cannot trace any such work.)

[3] 1897.—M. Burr, "Goodwill towards Earwigs" in 'Goodwill,' a Monthly Magazine for the People, iv. p. 114. (Mentions maternal affection in a Burmese earwig.)

[4] 1880.—L. Camerano, "Note intorno allo sviluppo della Forficula auricularia, Linn." in Bull. Soc. Ent. Ital. xii. pp. 46–50. (Original observations.)

[5] 1901.—J. H. Fabre, "Les Pentatomes," in Revue des Questions Scientifiques, l. pp. 158–76. (Adverse criticism of De Geer.)

[6] 1730.—J. H. Frisch, Beschr. von alley Insecten in Teutschland, &c., viii. pl. xv. (Notes on the "Ohr-Wurm.")

[7] 1901.—W. W. Froggatt, "The Pear and Cherry Slug (*Eriocampa limacina*, Retz., generally known as *Selandria cerasi*), with notes on Australian Sawflies," in Agric. Gazette, N.S.W., xii. pp. 1063–73. (Confirms, pp. 1068–9, Lewis's account of *Perga lewisii*, and figures the latter.)

[8] 1773.—C. De Geer, Mémoires pour servir a l'histoire des Insectes, iii. pp. 261–6 (extensive details of the maternal behaviour of *Cimex betulæ*), and iii. pp. 548–51 (the same of *Forficula auricularia*).

[9] 1662.—J. Goedaert, Metamorphosis et historia naturalis Insectorum, i. pp. 168–71, pl. lxxvi. (Note on *Gryllotalpa*.)

[10] 1870.—J. Hellins, "A fragment of a life-history of *Acanthosoma grisea*," in Ent. Monthly Mag. vii. pp. 53–5.

[11] 1872.—J. Hellins, "Note on the habit of *Acanthosoma griseum*," in *op. cit.* ix. p. 13.

[12] 1874.—J. Hellins, "Additional notes on the egg-laying, &c., of *Acanthosoma griseum*," in *op. cit.* xi. pp. 42–3.

[13] 1786.—J. F. W. Herbst, "Fortsetzung der Auszüge aus den Schwedischen Abhandlungen," in Füessli's Neues Mag. für die Liebh. der Entom. iii. pp. 33–91. (An abstract of Modeer's paper on pp. 64–7, "Modeers Merkwürdigkeiten bey der Wanze," &c.)

[14] 1828.—W. Kirby and W. Spence, An Introduction to Entomology, 5th edit. i. pp. 359, 360, and iii. p. 101. (Summary of the question and original note on *Forficula*.)

[Ed. 6, 1843, vol. i. pp. 301–3 ; ed. 7, 1858, pp. 202–3. I have not examined the first four editions.]

[15] 1902.—G. W. Kirkaldy, "On the parental care of the Cimicidæ," in Entom. xxxv. pp. 319–20. (Translation of Montrouzier and reference to another probable instance.)

[16] 1836.—R. H. Lewis, "Case of maternal attendance on the larva by an insect of the tribe of Terebrantia belonging to the genus *Perga*, observed at Hobarton, Tasmania," in Trans. Ent. Soc. Lond. pp. 232–4.

[17] 1889.—R. H. Lewis, Proc. Ent. Soc. Lond. i. p. xliv. (Confirmation of the above.)

[18] 1764.—A. Modeer, "Några märkvärdigheter hos Insectet Cimex ovatus pallide griseus, abdominis lateribus albo nigroque variis alis albis basi scutelli nigricante," in Vetensk. Acad. Handl. xxv. pp. 41–57. (Abstract in German (1767) in same journal, xxvi. pp. 48–9, but I have not seen either. See No. 13.)

[19] 1855.—Montrouzier,* "Essai sur la faune de l'île de Woodlark ou Moiou," in Ann. Sci. phys. nat. agric. Lyon (2), vii. pp. 91–2. (Relates maternal affection in Scutellerinæ.)

[20] 1865.—E. Parfitt in J. W. Douglas and J. Scott, The British Hemiptera, i. pp. 108–4 (*Acanthosoma griseum*).

[21] 1832.—[J. Rennie], "Maternal care of the Earwig," in Penny Magazine, p. 60.

[22] 1749.—A. J. Rösel, Der monatlich herausgegeben Insecten Belustigung, ii. Heuschrecken und Grillen, p. 92, pl. xiv.

[23] 1895.—D. Sharp, Cambridge Nat. Hist. v. p. 214 (*Forficula auricularia* and *Labidura riparia*), and 517 (*Perga lewisii*).

[24] 1899.—D. Sharp, Cambridge Nat. Hist. vi. p. 546 ("*Acanthosoma griseum*").

The latest notices of Ambrosia beetles are found in—

[25] 1897.—H. G. Hubbard, "The Ambrosia beetles of the United States," Bull. U.S. Dep. Agric., new series, No. 7, pp. 9–30.

ON THE PARASITIC HYMENOPTERA AND TENTHREDINIDÆ COLLECTED BY MR. EDWARD WHYMPER ON THE "GREAT ANDES OF THE EQUATOR."

By P. Cameron.

(Continued from p. 97.)

Larsephna varipes, sp. nov.

Black, shining; the legs rufous, the hinder femora darker in tint; the hinder coxæ black; the hinder tibiæ pale, the apex and a band near the base black; the hinder tarsi more or less fuscous; wings hyaline, the stigma and nervures dark testaceous. ♀. Length nearly 4 mm.; terebra, 1 mm.

Hab. Pichincha, 12,000 ft.

Antennæ dark testaceous, blackish on the top; the scape paler in colour. Head black, closely and minutely punctured; the mandibles rufo-testaceous. Mesonotum closely, minutely, and distinctly punctured. Scutellum shagreened. Median segment shagreened, most strongly in the middle. Pro- and mesopleuræ shagreened, shining; the meta- closely, minutely, and uniformly punctured. Abdomen rufo-

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* I do not know Montrouzier's forename. Hagen cites it as "P." (Bibl. Ent. i. p. 547), but this is merely an abbreviation for "Père." He is indicated in his papers as "R. P." and "P. A.," possibly "Révérend Père" and "Père Abbé."

testaceous; the petiole and the dorsal basal half of the second and third segments black; the basal three segments are closely minutely punctured, the first more strongly than the others. Legs rufous; the posterior coxæ black; the hinder tibiæ and tarsi pale testaceous, almost white; there is a black band near the base of the hinder tibiæ, and a slightly broader one near the apex; the tarsi are darker-coloured, with the joints paler at the base.

LARSEPHNA FLAVOLINEATA, sp. nov.

Black; the second and following segments of the abdomen brownish, their apices narrowly banded with pale yellow; legs rufo-fuscous; the four anterior coxæ and trochanters pale clear yellow; the hinder coxæ and the basal joint of the trochanters black, the apex of the coxæ and the apical joint of the trochanters pale yellow; the base and apex of the hinder tibiæ black; wings clear hyaline, the stigma and nervures fuscous. ♀. Length, 4·5 mm.; terebra, 2 mm.

Hab. Corazon, 12,000 ft.

Thorax smooth and shining, the mesonotum shagreened, the apex of the median segment brownish; the metapleural keel indistinct. The narrow yellow bands on the apices of the abdominal segments are distinct on all the segments, and extend on to the ventral surface; the petiole is deep black; the segments becoming successively brighter and more rufous in tint towards the apex. The large stigma is black at the costa, the rest of it is testaceous; the nervures are fuscous.

The differences between this species and *varipes* may be expressed thus:—

Abdomen for the greater part rufous, not banded with yellow; the fore coxæ and trochanters rufous, the metapleural keels distinct; ovipositor half the length of the abdomen	*varipes.*
Abdomen black, narrowly banded with yellow, the fore coxæ yellow, the metapleural keels indistinct; ovipositor as long as the abdomen	*flavolineata.*

CRYPTINA.

CYANOCRYPTUS, gen. nov.

Transverse median nervure in hind wings broken near the middle. Transverse median nervure in fore wings not interstitial. Median segment reticulated throughout, and without a distinct transverse keel. Disco-cubital nervure not broken by the stump of a nervure. Antennæ stout, ringed with white. Apex of clypeus broadly rounded, depressed; it is not separated from the face. Median segment large, with a gradually rounded slope from the base to the apex; its spiracles elongated; the sides at the apex shortly toothed; the pleural carinæ of the metathorax complete. Wings uniformly violaceous; the areolet large, the sides not convergent above. Abdomen smooth; the spiracles of the second segment placed shortly before the middle.

The body is metallic; the parapsidal furrows do not reach to the middle; the scutellum is roundly convex, not much raised; the abdominal petiole is longish, slender, dilated at the apex; the first joint of the flagellum is longer than the second; the lower part of the mesopleuræ is irregularly striated towards the apex.

In Ashmead's arrangement of the *Cryptina* (Proc. U. S. Mus. xxiii. p. 40) this genus would come in near *Joppoceras*.

CYANOCRYPTUS METALLICUS, sp. nov.

Dark blue, with purple and brassy tints; the wings uniformly fuscous-violaceous, the stigma and nervures black; the antennæ black, ringed with white. ♂. Length, 18 mm.

Hab. Outer slope, Equador, 7–8000 ft.

Antennæ black, fuscous on the lower side; the scape shining, the flagellum dull in tint. Head dark blue with purple and rosy tints; the outer orbits shining, sparsely punctured; the front, vertex, and face more opaque, punctured, but not closely or strongly; the upper part of the front closely and finely transversely striated. Basal half of mandibles strongly, but not very closely, punctured; the two apical teeth are of almost equal size, and are rounded broadly at the apex. Mesonotum minutely punctured; its sides towards the apex are depressed; the scutellum is almost impunctate; its basal depression bears five or six longitudinal keels. The lower part of the propleuræ bears some stout longitudinal keels; its base is bordered by a keel. Mesopleuræ, except above, irregularly longitudinally striated and reticulated. Median segment entirely closely irregularly reticulated; on the sides the reticulations are more regular and oblique. The coxæ, trochanters, and femora are purple with rosy tints; the tibiæ and tarsi are dull black; the tarsi are minutely spined. Abdomen shining, impunctate, dark blue, tinged with purple.

WHYMPERIA, gen. nov.

Antennæ stout, distinctly dilated beyond the middle; their third, fourth, and fifth joints equal in length. Head sharply obliquely narrowed behind the eyes; the inner orbits of the eyes sharply keeled, the keel extending from below the antennæ to the lower ocellus, and clearly separated from the eyes. Clypeus clearly separated from the face; its apex transverse. Mandibles curved, narrowed, towards the apex, but not sharply; the apex with a depression in the centre; the teeth not clearly separated. The upper edge of the pronotum roundly projecting. Parapsidal furrows obsolete. Scutellum large, not much raised. The basal keel on the median segment is distinct; the apical is less distinct in the centre, and projects laterally into a broad tooth; the spiracles are large, elongate. The base of the segment has a large area in the middle, obliquely narrowed towards the apex; its sides are not sharply margined. The pleural furrow is distinct; the metasternal keel is complete; stout at the base, narrower at the apex. Abdominal petiole long and slender, not much thickened at the apex, curved. The areolet is large, broad; the transverse basal nervure is interstitial; the cubito-discal nervure does not have a stump of a nervure; the transverse median nervure in the hind wings is broken in the middle. The metathorax is short, and has an oblique slope from the first transverse keel.

A distinct genus, easily known by the thickened stout antennæ, by the keeled front, by the sharply obliquely narrowed temples, by the projecting edge of the pronotum, and by the long hinder legs. In Ashmead's arrangement it would come in near *Habrocryptus*.

WHYMPERIA CARINIFRONS, sp. nov.

Black, the head and thorax largely marked with white; the second and following segments of the abdomen rufous, the legs pale yellow; the four hinder femora rufous; the hinder coxæ black, their top with a large white mark; the wings hyaline, the stigma and nervures black. ♀. Length, 11; terebra, 8 mm.

Hab. Ecuador, 1–2000 ft.

Antennæ black, the eighth to fourteenth joints more or less white, the thickened apical joints fuscous. Front and vertex smooth and shining; the face somewhat coarsely striated; the clypeus with scattered punctures round the top and apex; its apex depressed and black. Labrum white, fringed with long golden hair. Mandibles black, with a small curved white spot on the base. Palpi white. Thorax black; the dilated part of the pronotum, two lines in the centre of the mesonotum, narrowed at the base and apex, the scutellum, post-scutellum, a mark, transverse at the base, rounded at the apex, two large marks on the apical slope, a mark on the lower side of the propleuræ, the tubercles narrowly in the centre, a large mark on the top of the mesopleuræ, a larger irregular mark on the lower side of the mesopleuræ, with a rounded incision on its upper side, a mark immediately below the hind wings and the greater part of the upper half of the metapleuræ, pale yellow. The middle femora are darker-coloured than the posterior. Petiole smooth and shining; its apex and a narrow line behind the middle yellow; its ventral surface is brownish; there is a broad, irregular black band near the apex of the second segment.

(To be continued.)

ON BUTTERFLIES COLLECTED BY MAJOR E. M. WOODWARD IN BRITISH EAST AFRICA.

By EMILY MARY SHARPE.

THE following is a list of the species of butterflies obtained by Major E. M. Woodward on his journey from the coast to Uganda and Nandi. He obtained two new species, which I described under the names *Neptis woodwardi* (Nymphalidæ) and *Planema nandensis* (Acræidæ). *Cf.* Ann. & Mag. Nat. Hist. (7), vol. iii. pp. 243, 244 (1899).

Family DANAIDÆ.

1. DANAIS CHRYSIPPUS (*Linn.*).—*a, b,* ♂ ♀. Wakolis, Usoga; October 15, 1897.

2. D. ALCIPPUS (*Cram.*). — *a*, ♀. Samia Hills, Kavirndo; March 7, 1898.

3. D. KLUGI (*Butl.*).—*a*, ♂. Kibaoni, Ukambani; April 20, 1898. *b*, ♂. Tsavo River, Ukambani; August 1, 1897.

4. AMAURIS ENCELADUS (*Brown*).—*a*, ♂. Mondo, Chagwe; February 28, 1898.

5. A. HECATE (*Butl.*).—*a*, ♂. Campi Rao, Nandi; March 14, 1898.

6. A. DOMINICANUS, *Trim.*—*a*, ♂. Muani, Ukambani; August 17, 1897.

7. NEBRODA ECHERIA (*Stoll.*).—*a*, *b*, ♂. Campi Rao, Nandi; March 14, 1898. *c*, ♀. Eldoma Ravine, Mau; March 21, 1898.

Family SATYRIDÆ.

8. GNOPHODES DIVERSA, *Butl.* — *a*, ♀. Campi Rao, Nandi; March 14, 1898. *b*, ♀. Mbabani, Usoga; March 4, 1898.

9. MYCALESIS AURICRUDA, *Butl.* — *a*, ♂. Wakolis, Usoga; March 4, 1898. *b*, ♀. Nandi; March 16, 1898.

10. M. SAFITZA, *Hewits.*—*a*, ♂. Campi Rao, Nandi; March 13, 1898. *b*, *c*, ♂ ♀. Wakolis, Usoga; October 16, 1898.

11. M. SAGA, *Butl.*—*a*, ♀.

12. M. TECHNATIS, *Hewits.* — *a*, ♀. Campi Rao, Nandi; March 14, 1898.

13. M. SANDACE, *Hewits.*—*a*, ♂. Mondo, Chagwe; February 28, 1898.

14. M. RHANIDOSTROMA, *Karsch.* — *a*, ♂. Mondo, Chagwe; February 28, 1898.

15. M. MARTIUS, *Fabr.*—*a*, ♂. Nandi; March 16, 1898. *b*, ♂. Campi Rao, Nandi; March 14, 1898.

16. M. VULGARIS, *Butl.*—*a*, *b*, ♂. Mondo, Chagwe; February 28, 1898.

17. M. DENTATA, *E. M. Sharpe.*—*a*, ♂. Mondo, Chagwe; February 28, 1898.

18. M. SAUSSUREI, *Dewitz.*—*a*, ♂. Mondo, Chagwe; February 28, 1898. *b*, ♂. Kzwaligoma, Uganda; February 27, 1898.

19. M. PERSPICUA, *Trim.*—*a–c*, ♂ ♀. Campi Rao, Nandi; March 12–14, 1898.

20. YPTHIMA ALBIDA, *Butl.*—*a*, ♂. Usabara, Uganda; February 26, 1898. *b–d*, ♂ ♀.

21. Y. DOLETA, *Kirby.*—*a*, ♀. Campi Rao, Nandi; March 14, 1898.

22. Y. PUPILLARIS, *Butl.* — *a*, ♀. Campi Mauwi, Ukambani; August 16, 1897. *b*, ♂. Lubwa's Hill, Usoga; January 3, 1898.

23. Y. ITONIA, *Hewits.*—*a*, ♂.

24. **Neocœnyra gregorii**, *Butl.*—*a*. Kiu Hills, Ukambani; April 19, 1898.

25. **Aphysoneuria pigmentaria**, *Karsch.*—*a–c*, ♂ ♀. Eldoma Ravine, Mau; March 20, 1898.

Family Acræidæ.

26. **Acræa serena** (*Fabr.*).—*a–d*, ♂. Campi Simba, Ukambani; August 15, 1897. *e*, ♀. Mbabani, Usoga; March 4, 1898.

27. A. **vinidia**, *Hewits.*—*a*, ♂. Mondo, Chagwe; February 28, 1898. *b*, ♀. Wakolis, Usoga; October 16, 1897.

28. A. **cabira**, *Hopff.*—*a*. Campi Pashto, Nandi; March 15, 1898.

29. A. **uvii**, *Grose-Smith.*—*a*, *b*. Campi Pashto, Nandi; March 15, 1898.

30. A. **admatha**, *Hewits.*—*a*, ♂. Campi Rao, Nandi; March 14, 1898.

31. A. **pudorina**, *Stgr.*—*a*, ♂. Kiu Hills, Ukambani; April 19, 1898. *b*, ♂. Misongoleni, Ukambani; August 5, 1897. *c*, ♂. Derajemi, Ukambani; August 5, 1897.

32. A. **beæsia**, *Godm.*—*a*, ♂. Makindo River, Ukambani; August 14, 1897.

33. A. **cæcilia** (*Fabr.*).—*a*, ♀. Muani, Ukambani.

34. A. **lycia** (*Fabr.*).—*a*. Lugumbwas, Chagwe; March 1, 1898. *b*. Mbabani, Usoga; March 4, 1898. *c*. Mtigwa, Usoga; March 5, 1898. *d*. Kibaoni, Ukambani; April 20, 1898.

35. A. **natalica**, *Boisd.*—*a*, ♂. Misongoleni, Ukambani; August 5, 1897. *b*, ♂. Lugumbwas, Chagwe; March 1, 1898. *c*, ♂. Wakolis, Usoga; March 4, 1898.

36. A. **acara**, *Hewits.*—*a*, ♂. Campi Rao, Nandi; March 14, 1898.

37. A. **egina** (*Cram.*).—*a*, *b*, ♂. Wakolis, Usoga; March 4, 1898. *c*, ♂. Campi Pashto, Nandi; March 15, 1898.

38. A. **orbas**, *E. M. Sharpe.*—*a*. Campi Rao, Nandi; March 14, 1898.

39. **Planema johnstoni**, *Godm.*—*a*. Eldoma Ravine, Mau; March 22, 1898.

40. P. **lycoa**, *Godt.*—*a*. Campi Rao, Nandi; March 13, 1898.

41. P. **nandensis**, *E. M. Sharpe*; Ann. & Mag. Nat. Hist. (7) iii. p. 244 (1899).—*a*. Nandi; March 16, 1898. *b*. Campi Rao, Nandi; March 13, 1898.

42. **Pardopsis punctatissima** (*Boisd.*).—*a*. Kiboko River, Ukambani; August 14, 1897. *b*. Campi Mauwi, Ukambani; August 16, 1897. *c*. Wakolis, Usoga; October 5, 1897.

Family Nymphalidæ.

43. Hypanartia schœneia (*Trim.*). — *a.* Campi Darajemi, Nandi; March 18, 1898. *b.* Campi Aziwa, Nandi; March 19, 1898. *c.* Eldoma Ravine, Mau; March 20, 1898.

44. Pyrameis abyssinicus, *Feld.*—*a.* Campi Aziwa, Nandi; March 19, 1898.

45. Atella phalantha (*Drury*).—*a.* Mbabani, Usoga; March 4, 1898. *b.* Campi Rao, Nandi; March 13, 1898. *c.* Kibaoni, Ukambani; March 20, 1898.

46. Argynnis hanningtoni, *Elwes.*—*a–c.* Campi Aziwa, Nandi; March 19, 1898.

47. Pseudargynnis hegemone (*Godt.*). — *a*, *b.* Campi Rao, Nandi; March 14, 1898.

48. Junonia cebrene, *Trim.*—*a*, ♂. Campi Daraja, Nandi; March 12, 1898. *b*, ♀. Makindo River, Ukambani; March 13, 1898. *c*, ♂. Kiu Hills, Ukambani; March 19, 1898.

49. J. clelia (*Cram.*).—*a–d.* Campi Pashto, Nandi; March 15, 1898.

50. J. boöpis, *Trim.*—*a*, ♂. Muani, Ukambani; August 18, 1897. *b*, ♂. Kiu Hills, Ukambani; April 19, 1898. *c*, ♀. Campi Daraja, Nandi; March 12, 1898.

51. J. westermanni, *Westw.*—*a–d.* Campi Rao, Nandi; March 13–14, 1898.

52. Precis sesamus, *Trim.*—*a*, *b.* Campi Rao, Nandi; March 12–14, 1898.

53. P. natalica, *Feld.*—*a.* Muani, Ukambani; April 1, 1898. *b.* Campi Mauwi, Ukambani; April 22, 1898. *c.* Kiboko River, Ukambani; April 25, 1898.

54. P. infracta (*Butl.*).—*a.* Mtigwa, Usoga; March 5, 1898. *b–d.* Campi Rao, Nandi; March 14, 1898.

55. P. terea (*Drury*).—*a*, *b.* Wakolis, Usoga; October 15, 1897.

56. P. elgiva (*Hewits.*).—*a.* Nandi; August 24, 1897.

57. P. pelarga (*Fabr.*).—*a*, *b.* Campi Pashto, Nandi; March 15, 1898. *c.* Campi Rao, Nandi; March 14, 1898.

58. P. calescens (*Butl.*).—*a*, *b.* Campi Daraja, Nandi; March 12, 1898. *c.* Kiu Hills, Ukambani; April 19, 1898.

59. P. gregorii (*Butl.*).—*a–c.* Campi Rao, Nandi; March 13, 1898.

60. P. cœlestina, *Dewitz.*—*a.* Campi Daraja, Nandi; March 12, 1898.

61. P. orthosia (*Klug.*).—*a–c.* Lubwa's Hill, Usoga; January 2, 1898.

(To be continued.)

CURRENT NOTES.—NO. 1.

By G. W. Kirkaldy.

[1] R. F. **Scharff**: "Some Remarks on the Atlantis Problem"; 1903, Proc. Roy. Irish Acad., xxiv., Sect. B., pt. 3, pp. 268–302.
[2] G. **Breddin**: Fauna Arctica, 1902, ii., pp. 529–60 [Rhynchota].
[3] G. W. **Kirkaldy**: Fauna Hawaiiensis, 1903, iii., Hemiptera, pp. 99–174, pls. 4 and 5.
[4] E. D. **Ball**: 1901, Ohio Nat., i., pp. 122–4, pl. x. [Rhynchota].
[5] J. **Gulde**: "Die Dorsaldrüsen der Larven der Hemiptera-Heteroptera"; 1902, Ber. Senckenb. Naturf. Ges. Frankfurt, pp. 85–134, pls. 7 and 8.
[6] W. E. **Hinds**: 1902, Proc. U. S. Nat. Mus., xxvi., pp. 79–242, pls. i.–xi. [Thysanoptera].
[7] U. **Nawa**: "Notes on a Parasitic Moth"; 1903, The Insect World, vol. vii., no. 1, 2 pp., coloured plate.
[8] E. P. **Felt**: 1902, Bull. N. York State Mus., no. 59 (Entom., no. 16), pp. 49–84, 1 coloured and 5 photo plates.
[9] O. **Schmiedeknecht**; 1902, Opuscula Ichneumonologica, fasc. 1, pp. 1–80.
[10] H. **Schouteden**: 1902, Ann. Soc. Ent. Belg., xlvi., pp. 136–42 [Rhynchota].
[11] A. W. **Morrill**: 1903, Canad. Ent., xxxv., pp. 25–35, pl. 2 [Rhynchota].
[12] W. H. **Harrington**: 1903, Canad. Ent., xxxv., p. 37 [Hymenoptera].
[13] A. F. **Conradi**: 1902, N. Hampshire Agric. Exp. Sta., Bull. 94, pp. 89–92 [Coleoptera].
[14] C. M. **Weed**: 1902, *op. cit.*, Techn. Bull., 5, pp. 139–79.

Clarence Weed has published a bibliography of the economic relations of North American Birds [14], the list of works being much increased in usefulness by a brief summary of contents after most of the entries.

W. E. **Hinds** has monographed the North American Thysanoptera [6]. Up to the middle of 1902, only twenty-six species had been described, of which sixteen are considered valid or properly known; these are now increased to thirty-four, embraced by twenty-two genera. The descriptions are detailed, and are preceded by analytical tables and extended remarks on the general structure of the order, development, economic importance, &c., and are concluded by a bibliography. A curious misprint, "phyllogeny," occurs more than once, and a serious deficiency in the omission of generic references (now unfortunately too often the case in monographic or revisional work), nor is there any indication in the index as to new genera and species.

H. **Schouteden** enumerates the root-inhabiting aphids of Belgium and their relations with ants [10].

E. D. **Ball** describes the food-habits of some American *Aphrophora* larvæ [4]. The larvæ of *A. 4-notata* are found on various plants and shrubs; those of *A. parallela* are recorded as forming frothy masses (like the allied *Cercopis* [= *Philænus*] in this and other countries) on the tips of pine twigs. The American author notes that the larvæ of *A. permutata*, a rocky mountain species, were found, not on the twigs of pines, but down among the roots, ten or fifteen in a clump, and supposes that the "original pine-inhabiting species, finding themselves unable to maintain their froth-masses in their exposed positions on pine-branches in such a dry atmosphere, were compelled to seek moister conditions, such as are afforded by the shade and contact with the earth under these bushy plants."

G. W. **Kirkaldy** has published [3] the part of his Rhynchotal contribution to the 'Fauna Hawaiiensis' dealing with Coccidæ, Cixiaria, and Heteroptera; the Tetigoniidæ, Asiracinæ, and a small portion of the Heteroptera being reserved for further study. On p. 150 it is stated that the genus *Allæocranum* is represented for the first time. In 1899, however, it was figured in the Biologia Centr. Amer., Rhynch. Heter., ii., pl. 12, f. 6; Kirkaldy's doubtful admission of Cuba as a locality for *A. biannulipes* may now be confirmed, as Champion has taken it (p. 197) in Panama, Bugaba, and records it from Dorei Island, New Guinea, and Dr. Puton informs the present writer that it has been taken in France.

G. **Breddin** enumerates the Rhynchota and Siphunculata of the Arctic Region [2], including in this term the lands north of the limits of the birch, fir, and larch trees. Among species of wide distribution, and occurring also in Britain, may be mentioned *Nysius thymi*, *Gerris odontogaster*, *Reduviolus lhesigus* (= *Nabis flavomarginatus*), *Acanthia littoralis* and *saltatoria*, *Teratocoris viridis*, *Agalliastes wilkinsoni*, &c. Lists are also given of the Rhynchota of Iceland and the Färöes. In the former, Breddin has overlooked the records by the writer of *Corixa carinata* from Hagvelta, near Störvaldir, and of *Acanthia littoralis* from Störvaldir (1899, Revue d'Entom., p. 95).

E. P. **Felt** considers [8] the grapevine rootworm (*Fidia viticida*, Walsh, a coleopteron of the Chrysomelidæ) to be a much more serious enemy of the vineyardist than the grapevine leaf-hopper (*Erythroneura vitis*, Harris), for whilst the operations of the latter are confined to the leaves, and the amount of damage easily controlled, *Fidia* inflicts its most serious injuries underground, and in a great many instances a vine is nearly ruined before the trouble is noticed. "The secrecy of this insect's work, and the fact that the grubs operate on the large roots, where a small amount of girdling is fatal, constitute the most dangerous features of this pest." Vines on rich clay-soils sustain comparatively little damage, but on light sandy or poor soil the depredations are much worse. *Fidia viticida* is a native American, and has long been known as a feeder on wild grapevines, &c., and it is only within the last few years that it has become notable as a pest of the cultivated vine. The beetle was first noticed in Kentucky in 1866, and was at the same time or soon after taken in Illinois and Missouri, and is now known from New York State to Florida, and from Texas to Dakota. The life-history and habits are closely worked out, and remedial measures discussed.

O. **Schmiedeknecht** [9] has issued the first fascicule of his new "Opuscula Ichneumonologica," containing analytical tables of the genera of six ichneumonid tribes and of the palæarctic species of the genus Ichneumon.

Harrington [12] notes the capture of a male wasp (*Thyreopus latipes*, Smith) with female antennæ.

A. W. **Morrill** [11] describes and figures a new species of *Aleyrodes* from strawberry, with details of life-history.

A. F. **Conradi** [13] discusses "Remedies for Fleas": creolin being recommended.

J. **Gulde** [5] contributes an important paper on the dorsal glands in Heteropterous larvæ.

R. F. **Scharff** discusses [1] the Atlantis Problem, and concludes that Madeira and the Açores, up to miocene times, were connected with Portugal; that from Marocco to the Canary Islands, and from them to South America, stretched a vast land, which extended southward certainly as far as St. Helena. This great continent may have existed already in secondary times, and probably began to subside in early tertiary times. Its northern portions persisted until the miocene, when the southern and northern Atlantic became joined, and the Açores and Madeira became isolated from Europe. They again united with the Old World in more recent times, and were still connected in the early pleistocene with the continents of Europe and Africa, at a time when man had already made his appearance in Western Europe, and was able to reach the islands by land. These conclusions are reached by a study of all the animal classes, by no means least from the insects, which, in accordance with other groups, exhibit mostly South European or North African affinities. Among the forms omitted is the beautiful *Notonecta glauca* var. *canariensis*, peculiar, so far as is known, to the Canary Isles.

It has long been known that remarkable lepidopterous larvæ of the genus *Epipyrops*, Westwood (fam. Limacodidæ), live, either parasitically or commensally, on the living bodies of certain Fulgoridæ (Homoptera). Their nutriment is unknown, and the host is not destroyed by the visitor. The first notice was published in the Trans. Ent. Soc. Lond., 1876, pp. 519–24, pl. vii., on a species from Hongkong which spins its cocoon in the waxy appendages of *Pyrops candelaria.* The following year (1877, pp. 433–7, pl. x., fig. c) appeared a further notice of what was considered to be the same genus on a species of *Aphæna,* and also on *Eurybrachys spinosa* (belonging to a different sub-family), both from India. Westwood supposed that the lepidopteron is actually parasitic, feeding on the waxy matter, but quotes Wood-Mason as considering that the former only uses the homopteron as a means of conveyance. Recently the 'Insect World,' a magazine usually appearing only in Japanese, has published two pages in English (accompanied by a coloured plate), entitled "Notes on a Parasitic Moth," by Miss U. NAWA [7]. In August, 1898, Mr. Y. Nawa discovered, "on Mt. Yoro, some curious larvæ covered with white substance, and living on the outside of the abdomen of *Pomponia japonensis*" (a Cicadid). After a few days they spun cocoons, from which moths issued identical with one captured six years previously by Miss Nawa on Mt. Kinkwa, near Gifu. The larvæ were, later on, found on *Pomponia maculaticollis* and *Graptopsaltria calorata* (recte *colorata*). Similar larvæ were also found on the Fulgorid *Ricania japonica.* The moth in all its stages is described, but not identified. When full grown the body is covered with fine white hairs, which appear like a mass of cotton-wool. When full grown they leave their host, and move away to the trunks of trees or the leaves of plants, to spin their cocoons.

A LIST OF THE LEPIDOPTERA OF ROXBURGHSHIRE.

By W. RENTON.

I FIND that, as regards the Macro-Lepidoptera, Roxburghshire is one of the best counties in Scotland. Altogether I have taken three hundred and thirty-five species, of which twenty-seven are butterflies.

Pieris brassicæ.—Generally very common from April to September; too common, in fact, for the kitchen-garden. The larvæ are also common on swede turnips.

P. rapæ.—Also a common species throughout the county.

P. napi.—Numerous, like the preceding species.

Euchloë cardamines.—Common, June, 1901; only a few occurred in June, 1902. I did not take this species until the former date.

Colias edusa.—Fairly common in June and July, 1900, throughout the county.

Argynnis selene.—A very local species on Jed Water, near Jedburgh; also on Malcolm's Moss, near Minto, June and September.

A. euphrosyne. — Rare on Malcolm's Moss and Borthwickbrae Moss, June.

A. aglaia.—Common on Rubers-law, Minto Rocks, Tweed banks, near Kelso, June and July.

A. paphia.—Some seasons common on Minto Rocks. This is the only locality where I have taken this species.

Melitæa artemis.—Local in Duke's Woods and Muirfield Woods, both places near Hawick, end of June.

Vanessa urticæ.—Generally common throughout the county.

V. io.—This species is now becoming extremely rare; only a few species taken annually near Jedburgh.

V. antiopa.—I took one example of this rare species near Caver's House, Aug. 27th, 1900. I also had the pleasure of seeing another near Greenlaw, Berwickshire, September, 1896.

V. atalanta.—Very uncertain in its appearance; some seasons it is very common, while in others not a specimen is to be seen. Larvæ found on the stinging-nettle.

V. cardui.—Much like the preceding species in general. Larvæ found on various thistles and on burdock.

Erebia blandina.—Local in the south-west of Roxburghshire, Muirfield Woods, Kirton Moor, Borthwickbrae. This is a variable species. The larva is full grown in July, and found on all grasses where the insect occurs.

Pararge egeria.—One specimen near Ormeston Mains, Teviot, May 5th, 1901.

Satyrus semele.—The only locality known to me for this species is near Hawick Station, where it is fairly common.

Epinephele ianira.—Common all over the county, June to August.

Aphantopus (*E.*) *hyperanthus.*—A rather local species throughout the county. Var. *arete* occurs commonly. Some of the specimens are absolutely devoid of ocelli. Larvæ on grasses in June; imago in July,

Cœnonympha davus.—Found only in one locality on Reidfordgreen Moss, in June.

C. pamphilus.—One of the commonest of insects throughout the county.

Chrysophanus (*Polyommatus*) *phlæas.* — A rather rare and local species in general, occurring from June to October. I have bred this species, feeding the larvæ on sorrel.

Lycæna astrarche (*agestis*) var. *artaxerxes.*—Common near Hawick, Jedburgh, and Ancrum, found on grass banks in June and July.

L. minima (*alsus*).—Local, but common where it occurs in May and June.

L. icarus (*alexis*).—Another common species from June to September (second brood). Some fine varieties of this species are obtained in this county.

Adopæa (*Hesperia*) *sylvanus.*—I had a specimen brought to me by a boy last July; he took it when going to school, near Hawick. This was the first specimen recorded from this county to my knowledge.

Acherontia atropos.—A few annually in August throughout the county. Larvæ are found on potato, and in some seasons are fairly common.

Sphinx convolvuli.—Occurs more rarely than the preceding species. Specimens have been taken at Jedburgh, Hawick, and the larva found at Ednam, August, 1900.

S. ligustri, *Chærocampa porcellus*, and *Smerinthus ocellatus.*—Only a single example of each of these species has been taken in the county to my knowledge.

Smerinthus populi.—A rather common species in general. Larvæ are common on willows and sallows in August.

Macroglossa stellatarum.—In some seasons fairly common; abundant in 1900 and 1901. Larvæ in June and September, on bedstraw.

Trochilium crabroniformis (*bembeciformis*).—I have never taken the imago of this species, but larvæ are of frequent occurrence on Rubers-law, Jedwater, and Malcolm's Moss in May, in sallows.

Sesia tipuliformis.—I took one specimen in my garden on July 3rd, 1900.

Ino (*Procris*) *statices.*—Local in Duke's Woods end of June and July.

Sarothripus undulanus.—When collecting at sallows, near Kirton School, in April, 1901, a hybernated specimen was obtained.

Hylophila prasinana.—Rare near Kelso and Minto Woods, July and August.

Nudaria mundana.—Common everywhere in the county; larvæ on stone walls and also on lichen in hedgerows, April and May.

Gnophria rubricollis.—Larvæ were obtained last season (September) in Denholm Dene, on old elm trees.

Euchelia jacobææ.—One or two taken annually in the eastern portion of the county. I have never found the larva except on the coast.

Diacrisia (*Nemeophila*) *russula.*—This insect is now getting very rare on all the moors; burning the heather has something to do with this.

Parasemia (*N.*) *plantaginis.* — Occurs locally up and down the county; the variety *hospita* is also found. Larvæ are full grown in May, and are found on plantain.

Arctia caia.—At one time common, but getting extremely rare during the last few years.

Spilosoma fuliginosa.—More or less common everywhere in May and June. I have never taken the second brood. Larva in April; a general feeder.

S. mendica.—Has only been taken near St. Boswell's Station, in June. I believe that this species was first noted in the county by Mr. H. Dodds, of Galashiels, who captured a specimen in 1900.

S. menthastri.—Common everywhere from May to August. The larvæ are common in August and September on various plants.

Hepialus humuli, *H. sylvanus*, *H. velleda*, *H. lupulinus*, *H. hectus*; all more or less common throughout the county; also var. *carnus* of *H. velleda.*

Dasychira fascelina. — Common on Rubers-law, Kirton Moor, Shieldswood, and Muirfield, in June and July. Larvæ April to June, on heath.

Orgyia antiqua.—Very local in Wells Woods and Springwood Park Wood in August. I have found the larvæ on hazel.

Trichiura cratægi. — Another very local species. It occurs on Shieldswood Moors and Muirfield, in September. Larvæ found in May.

Pœcilocampa populi.—Odd specimens taken annually near Hawick. Beat the larva from thorn in June.

Macrothylacia (*Bombyx*) *rubi.*—Fairly abundant in many localities in June, but difficult to capture. Larvæ common from July to March, on moors and pastures.

Lasiocampa (*B.*) *quercus* var. *callunæ*.—Rather local on Rubers-law and other good moors in July. Larvæ are full fed in July, on heath.

Saturnia pavonia.—Much more widely distributed than the preceding species, on moors and bogs, April and May. Larvæ found on heath, sallows, &c., in August.

Drepana falcataria.—From one locality only in Springwood Park Woods, June.

Cilix glaucata.—Common in the district of Hawick only, in June. Bred the imago from larvæ collected in August, on whitethorn.

Dicranura furcula.—More or less common in the larval stage in August, but the imago is very rarely found.

D. vinula.—This species appears to be generally scarcer than the preceding.

Pterostoma palpina.—Collected the larvæ from sallows, in August, on Edderstone-lea Moss.

Lophopteryx camelina.—Found at rest on oak, birch, sallow, &c., in June. This species is well distributed throughout the county.

Pheosia (*Notodonta*) *dictæa*.—Very rare and local near Hawick and Jedburgh. The imago occurs in July, and the larva is found on poplar in August and September.

P. (*N.*) *dictæoides*. — Found the larva in August, on birch, in Adderstone-lea Moss and Cavers Woods.

Notodonta dromedarius. — Rather a common species in general throughout the county. The larva on birch and alder in August and September.

N. ziczac.—Another species that is common in the larval stage on sallows in August.

N. chaonia. — Found a female specimen on an oak-trunk on May 27th, 1900, near Hawick. The only specimen that I have taken of this species.

Phalera bucephala.—Local; on lime trees in larval stage, in August and September.

Pygæra pigra.—From one locality only in Newfield Moss, near Hawick, June.

Thyatira batis.—Occurs in June. It is a common and widely distributed species, and is generally the first moth that comes to sugar in the evening.

Cymatophora duplaris.—Taken only in one locality, Hagburn Glen, in June. The larva on birch in August.

Asphalia flavicornis.—Also a rare species and local, occurring near the gamekeeper's house, Wells, in April.

Bryophila perla.—Local on stone walls, June, near Hawick, Kelso, and Ancrum.

Demas coryli.—Occurs in June; I have specimens from the eastern portion of the county only. The larva is found on hazel in August.

Acronycta tridens.—Bred two specimens from three larvæ taken near Kelso in August.

A. psi.—More or less common throughout the county in June and July.

A. ligustri.—Of more rare occurrence, some seasons fairly common at sugar in June. Larvæ on ash in August.

A. rumicis.—Generally common.

A. menyanthidis.—A local species, occurring on Muirfield and Snnlaw Moss in June. Larvæ on heath in August.

Diloba cæruleocephala.—Have not seen this species since 1899, when it was common.

Leucania conigera, *L. lithargyria*, *L. comma*, *L. impura*, *L. pallens* (with the red form).—Generally common.

Tapinostola fulva.—Common on all the moors and bogs in August.

Calamia lutosa.—The only locality known to me is Semiston Moss, near Kelso.

Hydræcia nictitans.—Common on thistles in August and September, the var. *erythrostigma* well represented.

H. micacea.—A few specimens annually, on ragwort, in August. Rare in general.

Xylophasia rurea.—Common; also the variety *alopecurus.*

X. lithoxylea.—Less common than the preceding species.

X. monoglypha.—Common every year. Varies in colour from light grey to black.

X. hepatica.—Appears to be a local species in this county.

Neuronia popularis.—One specimen at Deanbrae in August, 1899.

Charæas graminis.—Common everywhere in August.

Cerigo matura.—A few specimens annually in July.

Luperina testacea.—Local; in the Hawick district only.

Mamestra furva—Generally common throughout the county, July and August.

M. brassicæ.—Of more rare occurrence in gardens.

Apamea basilinea.—Common everywhere.

A. gemina.—More local than the preceding, but common where it occurs.

A. didyma.—Common and variable.

Miana strigilis, *M. fasciuncula*, *M. literosa*, and *Petilampa* (*M.*) *arcuosa*, are all more or less common.

Celæna haworthii.—Found on all the mosses where the cotton-grass grows.

Stilbia anomala.—From one locality only, Ettrick-head, July and August.

Caradrina morpheus.—I only took this species last July, when collecting at white campion, near Hawick.

C. taraxaci.—A few specimens of this widely distributed species are taken each year in July.

C. cubicularis.—Common in barns and outhouses, &c., from April to September.

Rusina tenebrosa.—Common everywhere.

Agrotis suffusa.—Common near Kelso in August.

A. saucia.—One example at sugar in Duke's Woods, near Hawick, September, 1899.

A. segetum.—Common in 1897, but has not been seen since, at least by me.

A. exclamationis.—Common annually everywhere.

A. nigricans.—A few specimens only in 1899, on ragwort.

A. tritici.—One specimen only, near Kelso.

A. agathina.—Common in larval stage on all the good moors. Very difficult to rear.

A. porphyrea.—Common on all moors.

Noctua glareosa.—Of frequent occurrence on the borders of moors in August.

(To be continued.)

NOTES AND OBSERVATIONS.

The National Collection of British Lepidoptera. — The re-arrangement of the British Lepidoptera in the Natural History Museum at South Kensington is progressing; that of the families Arctiadæ and Noctuidæ being now complete so far at least as the material at present available in the Museum permits. A list of desiderata is subjoined in the hope that our readers may be disposed to assist in perfecting the collection, and making it really illustrative of the lepidopterous fauna of Great Britain.

Specially Wanted. — *Lithosia sericea*, Gregs., *Nudaria senex*, *N. mundana*, *Noctua depuncta*, *N. sobrina*, *Dianthœcia luteago* vars. *barrettii* and *fickleni*, *D. cæsia*, *Pachetra leucophæa*, *Leucania favicolor*, Barr., *L. albipuncta*, *L. loreyi*, *L. putrescens*, *L. vitellina*, *Cucullia gnaphalii*, *C. scrophulariæ*, Esp., *Polia xanthomista*, *Xanthia ocellaris*, *Cerastis erythrocephala*, *Hadena porphyrea* (*satura*), *Caradrina ambigua*, *Hydrilla palustris*, *Petilampa* (*Miana*) *arcuosa*, *Tapinostola elymi*, *Synia musculosa*, *Luperina dumerilii*, *Laphygma exigua*, *Cœnobia rufa*, *Nonagria geminipuncta*, *N. cannæ*, *N. sparganii*, *Plusia ni*, *Catephia alchymista*, *Micra ostrina*, *paula*, and *parva*.

Local Forms and Aberrations.—*Lithosia depressa*, *Emydia cribrum*, *Spilosoma lubricipeda*, *S. menthastri*, *S. mendica*, *Parasemia plantaginis*, *Arctia caia*, *Agrotis segetum*, *A. vestigialis*, *A. corticea*, *A. cinerea*, *A. cursoria*, *A. nigricans*, *A. tritici*, *A. exclamationis*, *Pachnobia hyperborea*, *Noctua festiva*, *N. glareosa*, *N. castanea*, *N. baja*, *N. brunnea*, *N. dahlii*, *N. xanthographa*, *Agrotis agathina*, *Dianthœcia nana*, *Hadena dentina*, *H. glauca*, *H. thalassina*, *Panolis piniperda* (green form), *Tæniocampa gothica*, *T. munda*, *T. stabilis*, *T. gracilis*, *T. opima*, *T. incerta*, *Charæas graminis*, *Leucania lithargyria*, *Heliophobus hispidus*, *Dryobota protea*, *Polia chi*, *Cleoceris viminalis*, *Aporophyla lutulenta*, *A. australis*, *Xanthia aurago*, *Orthosia rufina*, *O. suspecta*, *Anchocelis lunosa*, *A. pistacina*, *Cerastis vaccinii*, *C. ligula*, *Xylophasia rurea*, *Hadena adusta*, *Mamestra abjecta*, *Apamea nictitans*, *Celæna haworthii*, *Miana bicoloria*, *M. strigilis*, *Bryophila muralis* and *perla*, *Sarrothripa revayana*.

Ova, larvæ, and pupæ of almost any species would also be very useful.

Pupa of Vanessa polychloros attacked by Parasites.—I was very interested in reading Mr. Mathew's note on *Vanessa polychloros* (*ante*, p. 99), as I was myself thinking of writing about my experiences with this insect, which differ considerably from his. I used to think that after a lepidopterous insect had passed its larval state without getting stung it was immune from any further attacks of parasitic flies, but this, at any rate, does not seem to be the case with *V. polychloros*. In June, 1901, while cycling in this neighbourhood, I came across a large nest of the larvæ of this insect on sallow growing by the roadside. Although fairly grown—in fact, getting ready for the final moult—I managed to take sixty-two home in some chip-boxes I had with me. Sixty of these pupated, the other two dying from some unknown cause. The same month I found a fine large pupa of this species on an out-building near some elm trees; on proceeding to take it, I noticed two or three little flies crawling over it, which made me think they were emerging from it, but the pupa proved to be alive by violently kicking on my touching it. I also took three larvæ that were crawling about on the same building seeking suitable places to suspend themselves; these soon after pupated. From these sixty-four pupæ sixty-three imagines were bred, one only proving to be stung, being the one I took in the pupal state; from this a swarm of little flies emerged. Last year, *V. polychloros* being again common, my father and I took a few more larvæ that were about to change; these all reached the perfect state. Many of the others that were left hung themselves up under the eaves of some out-houses; these I watched. One in particular suspended itself low down where I could easily observe it. One morning I found that it had cast its larval skin either in the night, or earlier that day, and on my looking at it again that same morning I noticed one of the little flies, similar to those that had emerged from the pupa I took the previous year, crawling about for a considerable time all over it, and, as I suppose, laying its eggs, for on magnifying it, I saw that its ovipositor was protruding and touching the surface of the pupa. This was the first of the "wild" ones I was watching to pupate, and, like the majority of them, proved to be stung. I may add that all the pupæ obtained were kept indoors. *V. polychloros* has appeared again this year, one being seen on April 3rd.—J. F. Bird; "The Lodge," Cowfold, Sussex, April 6th, 1903.

Larvæ at Sugar.—On August 29th last, when visiting some sugared posts on our sandhills, I found a full-grown larva of *Agrotis ripæ* busily engaged sucking the bait. I watched it for some time, and there was no doubt that it was thoroughly enjoying itself. In the woods a few miles from here I have frequently seen larvæ of *Lithosia griseola* on sugared trees in early summer, and on one particular tree a larva came for several nights during a period of ten days. This was probably the same individual. On the coast sandhoppers are sometimes quite a nuisance, the patches of sugar being completely smothered with them.—Gervase F. Mathew; Dovercourt, Essex, April 16th, 1903.

Note on Polia serena.—Last autumn I obtained about a hundred larvæ of this pretty moth from the flowers of *Crepis virens*. They were placed in a large tin breeding-cage, half full of earth, in which were plunged two bottles to hold fresh food, and in due course they became full-grown, and buried, and the box was deposited upon a shelf in my breeding shed. One night last month a cat managed to get into the shed, and knocked the box off the shelf, and it fell to the ground on its side, and its contents were well shaken up. In trying to replace things as well as I could in their original position, I came across several cocoons. One of these I opened to look at the pupa, but discovered nothing but the shell of the pupa full of a mass of pinkish-grey powder. I opened another cocoon, and with the same result; so I then looked at the remainder, and to my disgust found that they were all in the same condition—there was not a living pupa among them. One or two of the cocoons contained shrivelled up larvæ, but all the others were in the same state as the first one. Has anyone had a similar experience with this species?—**Gervase F. Mathew**; Dovercourt, Essex, April 16th, 1903.

The Attitude of Hybernating Vespa occidentalis: a Comparative Study.—The article by F. W. Frohawk on the "Attitude of Hybernating Wasps" in the February 'Entomologist' interested me to investigate the circumstances attending the hybernation of our California species of wasp, *Vespa occidentalis*. The following is offered as a study for comparison. On March 6th I made observations on the bark of the blue-gum, a species of *Eucalyptus*, and found in the loose bark of this tree about a dozen specimens of hybernating wasps in a good state of preservation. The wasp rested with feet on the inside of bark, generally on thickest portions of loose bark, and almost invariably on the north side of the tree. The wings were not flat against the bark, except at end of abdomen where they protruded, and held between posterior legs and abdomen. The legs were under the wings, with the feet flat against the bark. The middle legs did not touch the bark, for the body was so humped as to rest on the front and hind legs. The head was lowered, with the antennæ curved about the neck between head and forelegs. They were perfectly dry and pliable, without any trace of a secretory fluid to hold them in place. The body was covered with beads of moisture, the largest beads being on the ventral side of the abdomen. The jaws were not fastened. They were wide apart, the mandibles slightly piercing the wood, but very readily relaxed their hold when the bark was inverted. This species under normal circumstances hybernates under ground, but owing to the rainy season (we have nearly all the rain of the year during the winter in California) the insect must seek a dry shelter, and the loose bark of the *Eucalyptus* offers an ideal refuge. The reason that the insect, in seeking a place for hybernation, selects the north side of the tree is, I presume, to protect itself from being irritated by the sun's rays. The winters here are exceedingly mild; the average annual minimum temperature is 32·1°, and the lowest temperature ever recorded is 24·9°.—**M. Metzmain**; Dept. of Entomology, University of California, Berkeley, California, March 7th.

Urticating Larval Hairs.—Referring to Mr. Carter's note (*ante*, p. 68) on the irritating properties contained in the hairy coats of "Bombyces," I can speak feelingly, as I was terribly punished when dealing with the larvæ and the cocoons of *P. chrysorrhœa*. I received a large nest of larvæ from my old friend Mr. Hargreaves, taken at Hove (near Brighton), and knowing by previous experience the effect of *P. auriflua* and *B. quercus*, I was most careful not to handle them; but if I only opened the cage to put in fresh food, I found the effect on my wrists, between my fingers, &c., and when the moths were emerging I was very badly punished several times, my eyes and neck suffering most; in fact, I got so annoyed that I turned the lot out into the garden, opened the cage-door, and let them all go. It was my first, and I think it will be my last, attempt at rearing that species.—W. E. Butler; Hayling House, Oxford Road, Reading, March 15th, 1908.

Erastria fuscula.—The food-plant of the larvæ of *Erastria fuscula* is without the slightest doubt *Molinia cærulea* in Devonshire. I first became acquainted with the fact in September, 1873, and my note on the subject will be found in the 'Entomologist,' vol. vii. p. 185 (August, 1874). In that note it will be seen that I searched the bramble, afterwards ferns and heath, and not finding it, turned my attention to sweeping the undergrowth, and in the first hour obtained about a dozen. The question then became, what was the food-plant? and on careful search over the herbage swept, found it on a coarse grass, which proved to be *Molinia cærulea.* After that I collected them without any trouble feeding about halfway up the blade of grass, taking them in September several years following.—G. C. Bignell, F.E.S.; Saltash, Cornwall, April 4th, 1908.

CAPTURES AND FIELD REPORTS.

Abnormal Appearance of Noctuæ.—Whilst sugaring at Boscombe with Major Robertson on March 21st, we took a fine specimen of *Hadena chenopodii*, evidently freshly emerged. The next night, March 22nd, Major Robertson's son took *Agrotis segetum* at sugar in good condition, apparently not hybernated. *Phlogophora meticulosa* was also common at sugar, and that they are this year's emergences is confirmed by Prof. Meldola taking a specimen drying its wings on March 26th.—J. A. Finzi; 53, Hamilton Terrace, N.W.

Note on Pupæ of Nonagria typhæ.—When hunting for pupæ of this species, I find the old previous year's dead stems by far the best place for them, and have taken as many as seven or eight pupæ from one stem.—Gervase F. Mathew; Dovercourt, Essex, April 16th, 1908.

Spring Lepidoptera at Wallington.—In our neighbourhood here the season has started very well, insects being both plentiful and varied. Of course the sallows have been the most productive, and all those within easy distance were visited, the following being the insects obtained:—*Panolis piniperda*, *Pachnobia rubricosa*, *Tæniocampa gothica*, *T. incerta*, *T. munda*, *T. gracilis*, *T. pulverulenta*, *T. stabilis*, *Orrhodia vaccinii*, *Scopelosoma satellitia*, *Hoporina croceago*, *Selenia bilunaria*, and *Larentia multistrigaria.* The gas-lamps have proved very attractive, and yielded *Tæniocampa incerta*, *T. gothica*, *Xylocampa lithorhiza*, *Selenia lunaria*, *S. bilunaria*, *Phigalia pedaria*, *Biston strataria*, *Hybernia marginaria*, *H. leucophæaria*, and *Anisopteryx æscularia.* Among larvæ, *Triphæna ianthina* has been swarming everywhere, and a good many *Apamea ophiogramma* have been taken from the ribbon-grass. Many others of all sorts have been captured, but I have not had time to get them named yet. Sugaring has only so far produced *Scopelosoma satellitia;* whilst of butterflies the only three noticed have been *Gonepteryx rhamni*, *Pieris rapæ*, and *P. napi*.—Leslie H. Mosse-Robinson; Wandle Bank, Wallington, Surrey, April 15th, 1903.

Notes on Coleoptera collected in 1902.—The greater part are from the New Forest between June 7th and 22nd, the remainder being nearly all from Surrey and Kent, in the vicinity of Croydon and Westerham. Two days, Easter Sunday and Monday, were spent at Westerham and Hever, but few species were taken, as I did not devote much time to beetles then. Whit Monday (May 19th) was spent in Surrey, near Farley and Chelsham, but the weather was very cold and wet. Aug. 4th was spent in nearly the same neighbourhood, when rather finer but dull weather was experienced.

The following is a list of captures, all being from the New Forest, except where otherwise stated:—

Cicendela campestris, *Carabus glabratus*, *C. catenulatus*, *Calosoma inquisitor*, *Notiophilus biguttatus*, *Leistus spinibarbus*, *Nebria brevicollis* (everywhere), *Bembidium gilvipes*, *B. lampros*, *B. brunnipes*, *B. tibiale*, *Pterostichus versicolor*, *P. lepidus*, *P. niger*, *P. nigrita*, *P. madidus* (everywhere), *Pristonychus subcyaneus*, *Calathus melanocephalus* (Cudham), *Anchomenus albipes*, *A. oblongis*, *Demetrias atricapillus* (Chelsham), *Dromius linearis*, *D. aglis*, *Harpalus ruficornis* (everywhere), *H. ignavus*, *Pelobius hermanni*, *Hydroporus gyllenhalli*, *H. erythrocephalus*, *H. planus* (New Forest and Wimbledon), *H. melanocephalus*, *H. nigrita*, *Ilybius fuliginosus*, *Agabus bipustulatus*, *A. chalconotatus*, *Philhydrus marginellus*, *Helochares lividus*, *Hydrochus elongatus*, *Sphæridium scarabæoides*, *S. bipustulatum*. *Cercyon melanocephalus*, *C. analis*, *Necrophorus mortuorum*, *Silpha atrata*, *Leptusa fumida*, *Microglossa nidicola* (Downe), *Aleochara brevipennis*, *A. lanuginosa* (New Forest; Wimbledon), *A. nitida*, *Myrmedonia canaliculata*, *Oxypoda lividipennis*, *Homalota gregaria*, *Tachinus rufipes*, *Tachyporus solotus*, *T. chrysomelinus*, *Conurus littoreus*, *Bolitobius atricapillus*, *Quedius impressus* (Chelsham), *Q. tristis*, *Ocypus olens* (Hever), *Philonthus varius*, *P. agilis*, *Baptolinus alterrans*, *Pæderus littoralis*, *Stenus speculator*, *S. similis* (Warley and New Forest), *S. tarsalis*, *Oxytelus rugosus*, *O. laqueatus*, *Olibrius consimilis* (near Westerham), *Coccinella 11-punctata* (Chelsham), *C. 7-punctata* (Chelsham), *C. occellata*, *C. 18-guttata* (Kent), *C. 14-guttata* (Kent), *Hister unicolor*, *H. carbonarius*, *Brachypterus urticæ*, *Meligethes rufipes*, *M. viridescens* (Kent and Surrey), *Epurea æstiva*, *Omosita discoidea* (near Brasted), *Cryptophagus scanicus*, *C. patruelis*, *Scaphisoma agaricinum*, *Scaphidium quadrimaculatum*, *Byrrhus pilula*, *Parnis prolifericornis*, *Lucanus cervus*, *Onthophagus nuchicornis*, *Aphodius fossor*, *A. fætans*, *A. fimetrarius*, *A. granarius*, *A. putridus*, *A. sticticus*, *A. tristis*, *A. quadrimaculatum*, *A. depressus*, *Geotrupes typhæus*, *G. stercorarius*, *G. spiniger*, *Phyllopertha horticola*, *Cetonia aurata*, *Elater sanguinolentus*, *Melanotus rufipes*, *Athous hæmorrhoidalis* (everywhere), *A. vittatis*, *Corymbites quercus*, *C. holeosericeus*, *Agriotes sobrinus*, *A. pallidulus* (everywhere), *Serricosomus brunneus*, *Dolopius marginatus* (everywhere), *Camplyus linearis*, *Helodes minutus*, *Cyphon coarctatus*, *Telephorus alpinus*, *T. rusticus*, *T. pellucidus*, *T. nigricans*, *T. bicolor*, *T. fulvus*, *T. testaceus* var. *limbatus*, *T. pallidus*, *Malthinus fasciatus*, *Malachius bipustulatus*, *Dasytes plumbeo-niger*, *Tillus* *elongatus*, *Anobium domesticum*, *A. paniceum* (in store-box), *Clytis arietis*, *C. mysticus*, *Mesosa nubila*, *Rhagium inquisitor*, *R. bifasciatum*, *Toxotus meridianus*, *Anoplodera sexguttata*, *Grammoptera tabacicolor*, *G. ruficornis*, *Donacia linearis*, *D. sericea*, *Lema cyanella*, *L. melanopa*, *Cryptocephalus aureolus*, *Chrysomela polita*, *C. didymata*, *Lina populi*, *Gonioctena viminalis*, *Phædon tumidulum* (Farley and New Forest), *P. cochleariæ*, *Prasocuris aucta*, *Adimonia capreæ*, *A. sanguinea*, *Galeruca viburni*, *Luperus betulinus*, *L. flavipes*, *Hermeophaga mercurialis* (near Farley), *Crepidodera transversa* (near Selsdon Park), *C. aurata*, *Aphthona cærulea*, *A. venustula*, *Phyllotreta atra*, *P. nemorum* (Farley), *Plectroscelis concinna* (Farley), *P. aridella*, *Thyamis lurida*, *T. thoracica*, *T. melanocephala*, *T. pusilla* (Westerham), *Helops striatus* (everywhere), *Lagria hirta* (New Forest and Westerham), *Asclera cærulea*. *Anaspis frontalis*, *A. forcipata*, *A. fasciata*, *A. ruficollis*, *A. thoracica*, *A. subtestacea*, *A. melanopa*, *Rhyncites æquatus*, *Apion striatum*, *A. difforme* (Surrey), *A. flavipes* (Kent), *A. ervi*, *A. loti*, *A. miniatum*, *A. frumentarium*, *A. violaceum* (everywhere), *Cneorrhinus exaratus*, *Trachyphlœus spinimanus*, *Strophosomus coryli* (New Forest and Westerham), *Barypeithes brunnipes*, *Phillobius pyri*, *P. alneti*, *P. argentatus*, *P. maculicornis*, *P. pomonæ*, *Otiorrhyncus picipes*, *O. ovatus*, *Sitones puncticollis* (Farley), *Hylobius abietis*, *Orchestes fagi*, *Cœliodes quadrimaculatus* (everywhere), *Amalus scortillum*, *Rhinonchus pericarpius* (near Selsdon Park), *Balaninus glandium*, *B. villosus*. —Norman L. Gillespie.

Notes on the Lepidoptera of the Harwich District, 1902.—I think it will be generally admitted that the season of 1902 was a poor one for both perfect insects and larvæ, yet, in some respects, it was a remarkable one in this district; for while many of our most common species were almost entirely absent, or very scarce, others were more than usually abundant in both their stages. Of our butterflies, the common whites (*Pieris brassicæ*, *rapæ*, and *napi*) were rarely seen, *Euchloë cardamines* was scarce, as were also the hybernated Vanessids in the spring, and fresh specimens in the autumn, but the larvæ of *Vanessa polychloros* were very plentiful, as I have recorded elsewhere, although the perfect insects were not noticed afterwards. Two or three worn *Pyrameis cardui* were seen in June, and several fresh ones in August and September. *Colias edusa* was seen on August 9th and 22nd, and one was captured on September 16th and one on 17th. *Lycæna argiolus* was tolerably numerous in the spring, but the autumn brood was scarce, very late, fresh-looking butterflies being seen up to September 17th, and larvæ only about half grown were beaten from ivy on November 7th. *Chrysophanus phlœas* I did not see once during the year, though I kept a careful look-out for it, as I wanted a female for eggs. At the end of May and beginning of June the larvæ of *Thecla quercus* and *Tæniocampa cruda* were more numerous than I ever remember, dozens falling into the umbrella at every blow of the beating-stick, but they were not accompanied by the usual hosts of larvæ of *T. stabilis*, *Cheimatobia brumata*, *Hybernia defoliaria*, *H. leucophæaria*, &c., which are such pests in most seasons. Searching for larvæ with a lantern at night, or beating undergrowth, in April and beginning of May, was not very productive, the only species in any numbers being *Triphæna fimbria*. When full grown, these large fat larvæ are very easily seen as they crawl up long shoots of Spanish chestnut, the opening leaves of which are a special attraction to them. Larvæ of *Noctua triangulum*, *N. baja*, and *N. brunnea*, usually common, were very scarce, and I only beat one of *Aplecta nebulosa*. At the end of May and beginning of June *Eupithecia dodoneata* was taken rather commonly from trunks and branches of evergreen oak, but it is a very local species here. At the beginning of June a few larvæ of *Pseudoterpna pruinata* were beaten from broom, also a few of *Chesias spartiata*, a species generally very abundant. At the same time a few larvæ of *Xylophasia scolopacina* were swept after dark from grass growing in shady places in woods, but most of these were stung, and only about a dozen moths bred. Larvæ of *Leucania straminea*, usually full grown about the middle of June, were still small on the 23rd of the month, and apparently very scarce; a few full grown were taken towards the end of the month, but these were nearly all stung, as is generally the case with late larvæ of this species. From the middle to end of July *Mamestra abjecta* was met with on the coast in goodly numbers, feasting on the blossoms of marram grass, and continued to visit this attractive bait, or sugar, until the end of August. It is a species that gets worn very quickly, and should consequently be taken as soon as possible after emergence. A few *Senta maritima*, with three of the var. *bimaculata* and one of var. *nigrostriata*, were taken among reeds in July. This is an insect that keeps out for a long time, for I have taken it from middle of June to middle of August. *Agrotis nigricans* was beaten in numbers from lime blossom early in August, and on 11th and 12th of the same month nearly two hundred pupæ of *Nonagria geminipuncta* were taken from reed stems. On the latter date I received a larva of *Acherontia atropos* from Margate, the only one noticed this year, and this produced a fine moth on October 31st. *Heliothis armigera* was seen on September 1st, and on the 2nd fifty pupæ of *Nonagria typhæ* were taken from the stems of bulrushes, but it was rather late for them, for several empty pupa-cases were found, and one moth emerged on the way home. On the 7th of the same month *Cucullia asteris* was bred, which was remarkably late, as on that day I obtained thirty-seven of the larvæ, some of which were full grown. A few larvæ of *Pyrrhia* (*Chariclea*) *umbra* were found on *Ononis* in August and September, chiefly by searching with a lantern at night, as they were then sitting quite exposed on the highest stems of their food-plant. Beating oaks on the outskirts of woods and bushes in hedges for larvæ in August and September was a miserable failure, as scarcely any could be obtained that way, though some autumn larvæ were very abundant in other places. Those of *Hadena oleracea* simply swarmed on the tamarisk growing on the slopes facing Dovercourt Bay, and when full grown were to be seen in hundreds high up on the bushes, while others were constantly crossing the pavements and paths, and scores were trodden under foot. The beautiful larvæ of *Cucullia asteris* were very numerous on *Aster tripolium* by the sides of ditches in the salt marshes; the conspicuous larvæ of *Hadena pisi* were equally plentiful on broom, the pretty larvæ of *Polia serena* were numerous on flowers of *Crepis virens*, while those of *Emmelesia unifasciata* must have been in prodigious numbers on the flowers and seeds of *Bartsia*, judging from the quantity I gathered in three small bundles of the plant early in September. These were placed in three bandboxes, with a part of their lid cut out, and muslin substituted. In a day or two the larvæ began to appear on the muslin, and continued to do so until the middle of October, by which time I had transferred no less than four hundred and seventy-seven into two of my breeding-cages.—Gervase F. Mathew (Paymaster-in-Chief, Royal Navy); Dovercourt, Essex, March 19th, 1903.

Notes on Collecting Lepidoptera during 1902.—In these notes I do not intend to deal with all the species taken during the year, but only with the more interesting captures.

"Sugaring," which is usually the most profitable mode of collecting Lepidoptera, was, I think, this year, the least productive; March, October, and November were the only months in which moths were attracted in anything like the usual numbers.

In March *Tæniocampa populeti* and numerous hybernated Noctuæ were attracted; and in October and November *Cerastis vaccinii*, *Orthosia lota*, *Calocampa exoleta*, *Gonoptera libatrix*, and many others, were attracted: while a few very favourable evenings in June produced *Cymatophora or*, *C. duplaris*, and *Grammesia trilinea* in very small numbers.

This scarcity of moths at "sugar" was, I think, due to honeydew having been so general. By working honeydewed bushes—which stood somewhat isolated—with a lantern, I took *Hydræcia micacea*, *Miana literosa*, *M. bicoloria*, *Caradrina morpheus*, *C. taraxaci*, *C. cubicularis*, *Agrotis nigricans*, *A. tritici* (one),* and a number of others of less interest.

Throughout the season dusking was by far the best mode of collecting Lepidoptera; the rarest moth obtained in this district during the season was taken in this way by Mr. M. C. Dixon, who, on boxing a specimen of *Hydrilla palustris*,† thought it was only *Miana arcuosa*.

Dusking in April and May resulted in the capture of *Selenia bilunaria*, *Lobophora carpinata* (*lobulata*), *Anticlea badiata*, *A. derivata*, and *Cidaria suffumata*; and in June *Lithosia mesomella*, *Hepialus velleda*, *H. lupulinus*, *H. hectus*, *Cilix glaucata*, *Odontopera bidentata*, *Aspilates strigillaria*, *A. gilvaria*, *Lomaspilis marginata*, numerous Eupitheciæ, *Melanthia albicillata*, *Cidaria corylata*, and a host of others.

In July the lanes and meadows swarmed with Lepidoptera (chiefly Geometræ) at dusk, and among the species taken were *Leucania impura*, *L. pallens*, *Axylia putris*, *Miana bicoloria*, *Uropteryx sambucaria*, *Cidaria prunata*, *C. fulvata*, *C. pyraliata*, *C. dotata*, *Pelurga comitata*, and *Eubolia limitata*.

During August very much the same things were taken as in July, with a few exceptions and additions; among the latter were *Larentia olivata* and *Epione apiciaria*.

Later on, towards the end of the year, *Hybernia aurantiaria*, *H. defoliaria*, *Cheimatobia brumata*, and *C. boreata* were taken.

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* *A. tritici*: this is only the second occurrence of this insect in Carlisle, and is rather a strange capture so far inland.—J. M.

† *Hydrilla palustris*: this is the fifth specimen taken in the Carlisle district; two were taken during the day, resting among the long grass; and three—including that now referred to—have been casually netted at dusk among other things. So far none have been taken at light.—J. M.

Day-work, like sugaring, was not what it should have been, owing to the stormy weather (most particularly on Saturdays, my half-holiday). But in spite of the weather I managed to net a few *Thecla rubi* between the showers in May; and in June and July I took *Argynnis selene*, *A. euphrosyne*, *Melitæa aurinia* (*artemis*), *Erebia epiphron* var. *cassiope*, *Cœnonympha typhon* (*davus*), *Ino statices*, *Nemeophila plantaginis* (and var. *hospita*), *Emmelesia albulata*, *Eupithecia nanata*, *Melanippe hastata*, &c.

I did not get many day-flying Lepidoptera of any interest after July, except *Thecla quercus* and numerous micros.

I have found dull days to be the best for trunk-searching, and the year 1902 not having been a sunny one, this mode of collecting was more productive than in former years. In March *Anisopteryx æscularia*, and in April *Xylocampa areola* and *Lobophora lobulata* were taken. During May and June Lepidoptera were very numerous on tree-trunks. Among the more noteworthy were *Demas coryli*, *Tephrosia crepuscularia*, *T. biundularia*, *Bapta temerata*, and *Melanthia albicillata*. After June I did not find trunk-searching very productive, although I took *Amphidasys betularia*, *Thera firmata*, &c.

The sallows, which in 1902 were very fine, were not workable until the beginning of April, when they failed to attract *Panolis piniperda* in anything like the numbers taken in former years; and although *Tæniocampa gothica*, *T. stabilis*, and *T. cruda* were very plentiful, *Pachnobia rubricosa*, *Tæniocampa instabilis*, and *T. gracilis* were not so.

Throughout the season working suburban gas-lamps was very productive, especially in late summer and autumn.

During 1902 certain species were more plentiful than in 1901; among these are *Diloba cæruleocephala*, *Hydræcia micacea*, *Luperina testacea*, and *Plusia gamma;* while some species—*Charæas graminis* and *Noctua xanthographa* for example—have been very scarce, although last year they simply swarmed.

Throughout the year I obtained many species by working flowers at dusk and after. At patches of deadnettle (*Lamium*), just at dusk, I took *Habrostola tripartita*, *Plusia chrysitis*, *P. iota*, and *P. pulchrina*. I also found *Carduus*, *Senecio*, and *Scabiosa* very attractive to Lepidoptera, both during the day and at night. Honeysuckle I have found most attractive on nights when sugar has failed.

I paid special attention to larvæ, and by beating, sweeping, and searching for species in this stage I have reared a large number of Lepidoptera. From larvæ taken at night in the spring I bred, among many other species, *Noctua castanea*, *Triphæna ianthina*, *T. fimbria*, *Pseudoterpna cytisaria;* and *Melitæa aurinia*, *Nemeophila russula*, *N. plantaginis*, &c., were bred from larvæ taken during the day.

I did not do much pupæ-digging, as I gave all my spare moments to larvæ-beating, although I bred *Agriopis aprilina*, *Phigalia pedaria*, *Hybernia defoliaria*, &c., from pupæ dug at the foot of oaks. I also got other pupæ, which I am now wintering along with a few hundred pupæ from larvæ beaten, swept, &c., during summer and autumn.—Jas. A. Malcolm; Carlisle, Jan. 1st, 1903.

Lepidoptera in Suffolk, 1902.—The year 1902 at the outset was unseasonably mild; winter then came, and lingered in the lap of spring and summer in most provoking fashion, so that it was not till the end of May that I was tempted to set forth on a ramble after Lepidoptera.

True I had heard of such things as *Aleucis pictaria*, *Tæniocampa rubricosa*, and *Anticlea badiata* having been taken at Ipswich street-lamps, but to toil all night and catch only one specimen is not the extent of my enthusiasm. I did visit the sallows once at Easter, but the wind came on to blow bitingly from the north-west, and having shaken a few of the commoner Tæniocampidæ into the sheet, I trudged home disgusted, and chilled to the marrow. Not till April 8th did I start my diary with the records of *Hypena rostralis* (2), *Depressaria applana* (3), and *Alucita polydactyla*. These I discovered hybernating in Freston Tower, of Margaret Catchpole associations. On April 29th *Tinea fuscipunctella* came to light at a public dinner at the Conservative Club. Then an uneventful month passed by till May 28th, when I had the unexpected good fortune to obtain *Amphidasys betularia* (var. *doubledayaria*), *Acronycta rumicis*, and *Trachea piniperda* at light. All were in the pink of condition, a circumstance which bespeaks the lateness of the season. With *T. piniperda* I was especially pleased, as I had been searching for it for ten years in various parts of Suffolk without success, a fact which points to its rarity. I believe the record is the first made in Ipswich. The *doubledayaria* var. of *A. betularia* was a rich black specimen with scarcely a speck of white, and that where the wings overlap. I have taken this melanic form almost yearly, though my collecting has been unavoidably spasmodic, which prompts the conclusion that it is by no means uncommon. As Suffolk is practically an entirely agricultural county, the point may be interesting to those who have sought for a solution in the influence of smoke from manufacturing centres.

My first excursion to Belstead Wood, that favourite resort of collectors, was on June 21st. I spent an afternoon with the beating-stick, the result being the capture of *Ephyra punctaria* (common on trunks), *Macaria notata*, *Acidalia remutata* (several), *Panagra petraria* (several), *Venilia maculata* (2). *Asthena luteata*, *A. candidata* (plentiful), *Eudorea ambigualis* (swarming on trunks), *Roxana arcuella*, *Crambus pascuellus*, *Halonota cirsiana* (*in cop.* on a thistle-head), *Herminia tarsipennalis*, *Harpella geoffrella*, *Adela degeerella*, and *Glyphipteryx fuscoviridella* (these swarmed in sheltered patches). I found *Anthocharis cardamines* in the country lanes still in good condition; one was a female. *Argynnis euphrosyne* was just coming out. I revisited the wood on the evening of June 25th, expecting to do well at dusking, but it proved an utter failure. In the two hours beforehand, however, I was kept continually going, my captures, mostly fugitives from trunks, comprising:—*Limacodes testudo*, *Drepana falcula* (*falcataria*), *Hepialus sylvanus*, *Acidalia subsericeata*, *A. trigeminata* (a lovely dark-marked specimen), *Cidaria corylata*, *Corycia temerata*, *E. punctaria*, *Ebulea verbascalis*, *A. ramella*, *Gelechia fugitivella*, *G. terrella*, *G. proximella*, *Gracilaria swederella*, *Lithocolletis quercifoliella* (several), *Tischera complanella*, *Ptycholoma lecheana* (2), and *Nepticula argentipedella*, and many others usually taken in May. *Sphinx ligustri* and *Smerinthus tiliæ* I also recorded in June.

An hour round the lamps on June 30th yielded good results. *Pyralis costalis* was in the pink of condition, and as numerous as last year. Other micros bottled were *Crambus cerusellus*, *Aspis udmanniana*, *Tortrix forsterana*, *Spilodes verticalis* (*cinctalis*), *Hydrocampa stagnata*, *Xanthosetia hamana*.

Incidentally, I may say that it is my practice to immediately kill all micros taken at light, keeping a separate poison-bottle fitted with a lining of cotton-wool for this purpose. They can easily be dislodged afterwards, and I find it more expeditious than using pill-boxes, whilst if proper precautions are taken there need be no trouble about stiffening.

Reverting to the night in question, the Bombyces were only represented by *Dicranura bifida* and *Ptilodontis palpina*, and the Noctuæ by *Dianthœcia cucubali*, *Grammesia trilinea* (3), and some other commoner things. The Geometræ, however, were in evidence, and included *Eurymene dolabraria*, *Acidalia amataria*, *Eupithecia rectangulata*, *E. succenturiata*, *Phibalapteryx vitalbata*.

Old walls were not so productive as I usually find them, but in the same spot where I always can find *Pædisca bilunana* I boxed what proved to be my most interesting record of the year, inasmuch as its identity at the time of writing is a matter of question, I believe. It is at present in the collection of Mr. C. G. Barrett, F.E.S., to whom I presented it after he had kindly endeavoured to name it. The specimen is a very fine one, and has a characteristic look about it, whilst it is much smaller than *Gelechia fugitivella*. The fact, however, that it was taken near some elms, Mr. Barrett thinks, strongly points to its being a tiny variety of that species. At any rate it is the nearest to it of any species known to Mr. Barrett. I should have added that the curious capture was made on June 28th, at Ipswich, at the foot of Anglesea Road.

Among other interesting micros descried on wall or paling were two dark forms of *Pædisca oppressana*, and some extremely variable *Tortrix xylosteana* and *Batodes angustiorana* ; also a large *Hyponomeuta padella*. Specimens of *Bucculatrix boyerella* and *Argyresthia retinella* were also discovered. *Tinea fuscipunctella*, *T. merdella*, *T. pellionella*, and *Gelechia affinis* were located in an attic.

Another visit on a fine day to Belstead Wood, on July 9th, was not at all unproductive. At the cottage in the lane I found the good lady had been keeping a very fine specimen of *Smerinthus ocellatus*, male, for the first comer. It was alive, but scarcely damaged. Search about the garden and outbuildings resulted in the finding of swarms of *Tinea ferruginella*, which were flying in groups like gnats. I boxed a very fine series, also a large and dark *T. pellionella*. Though there were numerous *Acidalia virgularia* on the sheds, I failed to find any more of the unique var. which I recorded the year before. The captures at the wood were not of great importance, but I was interested to net *Homœosoma sinuella* again. Other species met with were *Penthina cynosbatella*, *Sericoris lacunana* (3), *S. urticana*, *Ebulea verbascalis*, *Dicrorampha petiverella*, *Grapholitha trimaculana* (common), *Spilonota dealbana*, *Gelechia terrella*, *Œcophora lunaris*, *Œ. fuscescens*, *Argyresthia brochella* (4), *Coleophora limosipennella*, *Cemiostoma laburnella*, a var. of *Tortrix unifasciana*, &c. Amongst other records for July were *Œcogenia quadripunctata*, *Tineola biselliella*, and *Tinea merdella*.

I spent the first week of August at Felixstowe, but did no active collecting, as I was a victim to cramp most of the time. I was lucky one night, however, to take *Spilodes palealis* off a lamp; also *Liparis chrysorrhœa*. *Zygæna filipendulæ* were found flying in the same spot on the common as the previous year, but nowhere else. *Gelechia desertella* was common, and I found one *G. populella* on palings. I left Suffolk to go on a holiday to Bath, but the only good things taken were *Bryophila glandifera* and *Œcophora unitella*.

The latter end of August I removed from Suffolk to Norwich, and the exigencies of work on a daily paper precluded any collecting. *Catocala nupta* seemed to be numerous on walls, and I also saw *Xanthia cerago* and *Polia flavicincta*. *Melanthia bicolorata* was taken off a naturalist's window. The usual winter Geometræ were observed on the street-lamps.—Claude A. Pyett; 25, Grosvenor Road, Norwich.

SOCIETIES.

Entomological Society of London.—*March 4th*, 1908.—Professor E. B. Poulton, M.A., D.Sc., F.R.S. President, in the chair.—Mr. Harry Eltringham, of Eastgarth, Westoe, South Shields, was elected a Fellow of the Society.—Colonel Bingham sent for exhibition specimens of Diptera and two Aculeates from Sikhim, constituting in the banding of the wings and other characteristics a striking instance of mimicry. The Rev. F. D. Morice drew attention to the way in which the fly imitated with its tibia the tarsus of the bee.—Mr. A. J. Chitty exhibited specimens of *Atomaria rhenana*, Kr., taken by him out of some flood rubbish found near Lancing, probably the same locality where the beetle was discovered formerly by Dr. Sharp. He also exhibited a *Ptinus*, apparently new to Britain, where it had probably been introduced, found in a granary in Holborn in 1898.—Mr. W. J. Kaye exhibited species of Lepidoptera from British Guiana, forming a Müllerian Association in which all but one were day-flying moths, the exception being an Erycinid butterfly, *Esthemopsis sericina*. The moths, belonging to three families, included Syntomidæ: *Agyrta micilia* and *Euagra cœlestina*; Hypsidæ: *Iostola divisa* Geometridæ (?): *Pseudarbessa decorata*. It appears very evident from the specimens collected over eighteen months in exactly the same place, that the Syntomidæ in being so numerous have acted as the types, toward which the other species have converged. The particular interest of the exhibit consisted in the association being one of moths, a butterfly being the exception, and not one of butterflies with perhaps a single moth, which latter is so frequently the case in South America. The butterfly most closely resembled *Agyrta micilia*, one of the Syntomidæ that is perhaps the most abundant of all the groups.—Mr. C. O. Waterhouse read a paper entitled "Notes on the Nests of Bees of the Genus *Trigona*;" Mr. G. A. Rothney communicated a paper on "The Aculeate Hymenoptera of Barrackpore, Bengal," and "Descriptions of eighteen new species of Larridæ and Apidæ from Barrackpore, by Peter Cameron; and Colonel Charles Swinhoe communicated a paper "On the Aganiidæ in the British Museum, with descriptions of some new species."

March 18*th*.—The President in the chair.—Mr. H. W. Bell-Marley, Durban, Natal; Mr. J. C. Dollman, Newton Grove, Bedford Park, W.; Mr. W. W. Rowlands, Lickey Grange, near Bromsgrove; and Prof. J. H. Taylor, M.A., The Yorkshire College, Leeds, were elected Fellows of the Society.—The Rev. F. D. Morice exhibited, with drawings, a dissected gynandromorphous specimen of a bee (*Osmia fulviventris*, Panz.) sent to him (with the gynandromorphous *Eucera* exhibited at the last meeting, and several other similar monstrosities) by M. Jean Vachal, of Argentat, France. The species is a common one; whether that called *fulviventris* in the British list is a variety of it, or a distinct species, is not yet finally decided. — Mr. A. Bacot exhibited a number of specimens of *Malacosoma neustria* × *castrensis* in various stages, including a series of six male and sixteen female imagines reared during 1902 from one batch of ova laid by a female *castrensis*, which had been mated with a male *neustria*, and two females reared from another batch of ova the result of a similar cross; also blown larvæ of hybrid parentage, and twigs showing attempts at ovipositing on the part of female hybrids that had paired with hybrid males of the same brood; also a series of *M. neustria*, *M. castrensis*, and the hybrid moths reared during 1901 for comparison. The females attempted egg-laying, adopting the position and motions of normal females of *castrensis*, but at each opening of the ovipositor they produced only the small drop of cement which accompanies the egg in the normal oviposition of the parent species, resulting in a more or less perfect spiral band of cement upon the twigs. Perhaps the most interesting feature of the exhibit was the great variability shown by the specimens comprising the larger of the 1902 brood compared with the remarkable uniformity of the hybrid moths reared during the previous year.—Mr. H. St. J. Donisthorpe exhibited specimens of *Trimium brevicorne*, Reich., from Chiddingfold, Surrey, an unusually southern locality for this species.—Mr. C. P. Pickett, specimens of *Hybernia leucophæaria* and *Phigalia pedaria* taken at Chingford, and ova of *Endromis versicolora* on birch twigs, laid March 16th. The parent moths paired the day before at 1.20 p.m., and remained *in cop.* thirty-three and a-half hours. The female in the act of oviposition prefers to rest head downwards, and sometimes uses the back legs for arranging the ova.—Mr. G. C. Champion exhibited a long series of a series of *Cneorrhinus* (?*pyriformis*) from Piedrahita, Spain, and called attention to the great dissimilarity between the sexes, and also to the possibility of the females being dimorphic, one form clothed with green scales, and the other with grey scales like the male. He also exhibited *Dorcadion dejeani*, Chevr., from the Sierra de Bejar, a species peculiar to that district. — Mr. R. McLachlan, F.R.S., exhibited a dragonfly belonging to a small species of the genus *Orthetrum*, attacked by an Asilid fly almost as large as itself, taken in Persia in June, 1902, by Mr. H. F. Witherby. The fly had inserted its proboscis at the junction of the head and prothorax, a vulnerable point. He also exhibited a female specimen of a large Æschnid dragonfly, *Hemianax ephippiger*, Burm., captured in a street at Devonport, on Feb. 24th, 1903. The species has once been observed on the Continent as far north as Brussels.—Professor E. B. Poulton, F.R.S., exhibited seasonal forms of *Precis antilope*, parent and offspring, bred in 1902 by Mr. G. A. K. Marshall in South Africa, showing the remarkable dimorphism of the species, which was especially noticeable in the protective colouring of the under side of the dry-season form as compared with the startling conspicuousness of the wet. He also exhibited *Precis cœlestina*, captured by Dr. C. A. Wiggins in the Victoria Nyanza region, with the dry-season form of that species, now taken probably for the first time. The resemblance of the under side of the latter to dead leaves was very marked. Prof. Poulton also showed lantern-slides of the same two species.—Mr. W. J. Lucas exhibited with the lantern a slide showing the larva of *Cossus ligniperda* in its gallery in a tree-trunk. —Dr. T. A. Chapman exhibited with the lantern a series of slides illustrating the life-history of *Liphyra brassolis*, as described in the 'Entomologist,' vol. xxxv., pp. 158, 184.—Mr. G. C. Champion, F.Z.S., read a paper on "An Entomological Excursion to Bejar, Central Spain."—Mr. Edward Saunders, F.R.S., F.L.S., communicated a paper on "Hymenoptera Aculeata collected by the Rev. A. E. Eaton, M.A., in Madeira and Teneriffe, in the spring of 1902."—Dr. Frederick A. Dixey, M.A., M.D., read a paper, illustrated by lantern-slides, "On Lepidoptera from the White Nile, collected by Mr. W. L. S. Loat, F.Z.S.; with further Notes on Seasonal Dimorphism in Butterflies." He said that Mr. Loat's series did not seem to favour the opinion that had been held that *Teracolus evagore* as described and figured by Klug was the dry-season form of *T. yerburii*, Swinh. It appeared from this and other evidence that Mr. G. A. K. Marshall was right in dissociating the two forms.

April 1st.—The President in the chair.—Mr. M. Jacoby exhibited specimens of *Rhagiosoma madagascariensis*, Heyd., from Madagascar, and *Carpophagus banksiæ*, McLeay, and *Mecynodera coxalgica*, Boisd., from Australia. In appearance they presented many characteristics not usually associated with phytophagous Coleoptera. — Mr. C. P. Pickett exhibited forced specimens of *Dilina tiliæ* bred from Essex pupæ this year. In two females the usual rust-coloured markings on the fore wings were abnormally pale, and the hind wings were black. In another female the rust-red hue pervaded the whole wing area, the four normal green blotches being a deep reddish brown, corresponding with a form of *Smerinthus populi* frequently bred. A third female displayed light-brown hind wings; while one male was of the normal female colouration.—Mr. W. J. Lucas exhibited lantern-slides of the specimen of *Hemianax ephippiger*, and of the *Orthetrum* species attacked by an Asilid fly, shown by Mr. R. McLachlan at the last meeting.—Dr. T. A. Chapman read a paper entitled "Contributions to the Life-history of *Orina* (*Chrysochloa*) *tristis* var. *smaragdina*."—Sir George Hampson read a paper on "*Apoprogones hesperistis*, a remarkable new lepidopterous insect from Zululand." He said that the genus must be referred to the family *Euschemonidæ*, which is represented by the single species *Euschemon rafflesia*, Westw. In what quarter of the globe the family originated it was impossible to say, but the appearance of the species in question suggested that it was a survival of the scattered remnant of the Antarctic fauna. It was, however, most remarkable that the genus should occur in Africa and Australia alone. —Mr. F. Enock read a paper, illustrated with lantern-slides, on "The Life-history of *Cicindela campestris*." A discussion followed as to how far the abundance of food in the larval state affects the development of insects, in which Mr. W. E. Sharp, the President, and other Fellows took part. Mr. Enock said that where the food supply happened to be insufficient, neuropterous nymphs would continue two years in that stage, and Mr. C. O. Waterhouse mentioned a case reported to him of the larvæ of *Vanessa urticæ* which, having exhausted their summer pabulum, retired to hybernate until the following year. Mr. A. J. Chitty said he had observed that coleopterous larvæ under similar circumstances would consume flies; while Mr. H. St. J. Donisthorpe said that he had bred successfully a phytophagous species of the same order by feeding them on paper.—H. Rowland-Brown, *Hon. Sec.*

South London Entomological and Natural History Society.—*Feb.* 26*th*.—Mr. Step, F.L.S., President, in the chair.—Mr. F. G. Cannon, of Hampstead, was elected a member.—A special donation to the library was announced, consisting of a complete set of the papers and articles written by Prof. E. B. Poulton, F.R.S., on protective resemblance in insects, from the author.—Mr. Turner exhibited a number of species of Lepidoptera, Coleoptera, Hemiptera, and Diptera taken during a week spent at Inistioge, Co. Kilkenny, Ireland, in company with Mr. Step. Most of the species were common, but interesting as being records from a hitherto unworked district. *Soronia punctatissima*, a coleopteron found in some numbers in a *Cossus*-infected poplar tree, was worth noting as a new record for Ireland.—Mr. G. W. Browne, a number of Lepidoptera from Deal, taken in August, 1902, and including long and varied series of *Agrotis tritici* and *A. valligera*, together with *Syrichthus malvæ* v. *taras* from Hailsham, *Apamea ophiogramma* from Lee, *Dicycla oo* from Lee, and *Iodis vernaria* from Lee.—Mr. Goulton exhibited some very fine photographic slides of the ova and larvæ of several species of Lepidoptera.

March 12*th*.—Mr. E. Step, F.L.S., President, in the chair. Mr. Hickman, of Kennington Road, and Mr. Furnival, of Harlesden, were elected members.—Dr. Chapman exhibited living examples of the three European species of the genus *Thais*: viz. *T. rumina*, *T. polyxena*, and *T. cerisyi*. He also showed a bird parasite, *Docophorus communis*?, taken from a blackbird, and called attention to the curious jointed appendage in front of the antenna, which form a guard to the latter organ, and is said to occur in no other group of insects.—Mr. R. Adkin, series of *Acidalia aversata*, consisting of broods from a non-banded female and from a banded female. In both cases, banded and non-banded, offspring were produced. He also read notes as to the colour-variation of the two series.—Mr. W. J. Kaye, specimens of *Larentia didymata*, bred off broom from Co. Kerry. They had a very reduced central black band, and all the markings were very clearly contrasted with the very pale ground colour.—Professor E. B. Poulton, F.R.S., gave an address on "Recent Researches in Protective Resemblance, Warning Colours, and Mimicry in Insects," and illustrated his remarks with a very large number of lantern-slides.

March 26*th*.—The President in the chair. Mr. E. Warne, St. John's Hill, Clapham, was elected a member—Mr. Jennings exhibited a series of the very local *Cryptocephalus bipunctatus* (var. *lineola*, F.) taken at Charing, Kent, on hazel bushes.—Mr. Colthrup, hybernating larval nests of *Porthesia chrysorrhœa* from Newhaven, where they could be found abundantly.—Mr. W. J. Kaye, the two Ithomiines, *Methona confusa* and *Thyridia psidii*, from British Guiana, and remarked on the wonderful agreement in colour between these two distinct species, both there and in Paraguay.—Mr. Adkin, a very dark example of *Amorpha* (*Smerinthus*) *populi* bred from a larva taken at Bexley. It was considerably darker than a Sutherland example in both the olive-grey of the fore wings and the red patch of the hind wings.—Dr. Chapman, specimens of *Lasioptera rubi*, a Cecidomyid that makes swellings in the stems of bramble..—Mr. Hy. J. Turner, a large number of species of various orders of insects, collected at Amersham, Bucks, during a week's holiday spent there at the end of June, 1902, and gave notes on the fauna and flora of the district.—Hy. J. Turner (*Hon. Rep. Sec.*).

Lancashire and Cheshire Entomological Society.—The Annual Meeting of the above Society was held in the Royal Institution on Monday, January 19th, when, in the unadvoidable absence of the President, Mr. S. J. Capper, F.E.S., Dr. J. W. Ellis presided over a large attendance of members. Mr. J. Hidson Taylor, of Buxton, was unanimously elected a member of the Society.—The following officers were elected to serve during 1903:—President, Mr. S. J. Capper, F.E.S.; Vice-Presidents, Messrs. W. Webster, F.R.S.A.I., R. Tait, Jun., and F. C. Thompson; Hon. Treasurer, Dr. J. Cotton, F.E.S.; Hon. Secretaries, Messrs. E. J. B. Sopp, F.R.Met.S., F. Birch, and H. Tonkin; Hon. Librarian, Mr. R. Wilding; Council, Dr. G. W. Chaster, Messrs. J. R. le B. Tomlin, F.E.S., F. N. Pierce, F.E.S., John Lea, W. A. Tyerman, W. D. Harrison, and A. Tippins.—Mr. R. Newstead read a paper on the life-history of the following species of Coccidæ: *Eviopeltis festucæ*, *Lichtensia viburni*, *Vinsonia stellifera*, *Pseudococcus ulicis*; and also some important observations on the male of *Lecanium hesperidum*, which he has discovered undergoes a complete metamorphosis, as in the males of other species of the Coccidæ. Mr. Newstead also dealt with the formation of the curious test of waxy covering in *Ceroplastes*, and some important observations on the secretion of honeydew in *Palvinaria vitis* var. *ribesiæ*, a full account of which will appear in the second volume of his work on the Coccidæ of the British Isles, shortly to be published by the Ray Society.—The following exhibits were examined:—A pair of *Chrysophanus dispar* from Yaxley (1848), forming a portion of probably the last catch of the large copper in Britain, and a beautiful series of *Lycæna arion* from S. Devon, taken in 1902 by Mr. J. R. Charnley, who also exhibited, on behalf of Mr. T. Dewhirst, most excellent slides of *Cerura vinula* and *Pieris rapæ*; the genus *Oporabia*, showing hybrid forms between *O. filigrammaria* and *O. autumnaria*, by Mr. Pierce; nymphs and imagines of the exotic earwig, *Cheliochės morio*, from Sandakan and the Dammar Islands, by Mr. Sopp; *Lycæna acis*, by Mr. Collins; series of *Erebia blandina*, &c., by Mr. Prince; and an almost black *Abraxas grossulariata*, by Mr. A. Tippins.

The second ordinary meeting was held in the Royal Institution, Liverpool, on Monday, the President, Mr. S. J. Capper, presiding over a large attendance of members. The minutes having been confirmed, the Secretary announced donations to the library from Dr. J. Harold Bailey (Port Erin), and Mr. H. St. John K. Donisthorpe, F.Z.S.

(London). Mr. A. H. Lister, of Bootle, was unanimously elected a member of the Society, after which, on the motion of Dr. Cotton (St. Helen's), seconded by Mr. J. R. le B. Tomlin (Chester), it was decided to hold a summer gathering in Delamere Forest on June 18th. The paper of the evening was contributed by Dr. Edmund Capper, of Leicester, son of the veteran President, who dealt in a most interesting manner with "the story of *Acidalia contiguaria*," of which desirable lepidopteron he had probably captured more specimens, in its natural habitat on and in the neighbourhood of Moel Llys, than any other entomologist. Dr. Capper's paper, which traced the first occurrence of *A. contiguaria* to the late Mr. Richard Weaver in 1855 to its distribution at the present day, also dealt with many important facts in the life-history of the species. The paper was discussed by Mr. S. J. Capper, Dr. J. Ellis, and Messrs. Pierce and Tait, the latter of whom confirmed the lecturer's premise that only one brood was produced during the year. A hearty vote of thanks having been accorded Dr. Capper, the following exhibits were made:—*Noctua flammatra*, *Xylina conformis*, *Leucania extranea*, and other rare British Noctuidæ, by Mr. F. N. Pierce (Liverpool); long series of the light and dark forms of *A. contiguaria* from Penmaenmawr, by Mr. R. Tait, junr. (Manchester); *Thanasimus formicarius*, new to the local list, by Mr. Guy Dunlop (Mossley Hill); embryo nest of *Vespa germanica* from beehive, by Mr. F. Birch (Liverpool); a fine series of *Odontopera bidentata*, varying from black to very pale brown, and including one semi-diaphanous specimen, by Mr. B. H. Crabtree (Manchester), and a fine example of *Œdipoda cærulescens*, of which two specimens have been taken at Southampton, by Mr. E. J. B. Sopp (Birkdale), Hon. Secretary.

Birmingham Entomological Society. — *February* 16*th*, 1908. — *Annual Meeting.*—Mr. G. T. Bethune-Baker, Vice-President, in the chair. The annual reports of Council and of the Treasurer, &c., were received. The following were elected to be Officers and Council for the ensuing year:— President, Mr. G. T. Bethune-Baker; Vice-President, Mr. R. C. Bradley; Treasurer, Mr. R. C. Bradley; Librarian, Mr. A. H. Martineau; Hon. Secretary, Mr. Colbran J. Wainwright; Members of Council, Messrs. H. Willoughby Ellis, J. T. Fountain, A. D. Imms, and G. W. Wynn. The following were exhibited:—By Mr. G. T. Bethune-Baker, the remarkable Lycænid *Liphyra brassolis*, Hew., in various stages; larvæ in spirit, pupæ and imagines. He gave an account of its remarkable life-history as far as it has been discovered by Mr. Dod. He also showed imagines of three species of *Ogyris*, which are also ant-feeding Lycænids, but about which less is known at present.—Mr. H. Willoughby Ellis, two drawers of Carabidæ, including the Anisodactylina, Pterostichina, and Harpalina, which were shown partly to illustrate his new method of carding every specimen separately for greater convenience in examination.—Mr. A. H. Martineau, pupæ of a wasp from Mexico with a big fungus—*Cordiceps* sp.?—growing out of the thorax. It grows out between the prothorax and mesothorax, splitting the latter. It was remarked as curious that the insect should have successfully reached the pupal stage in each case.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

Economic Reports:—(1) C. P. Lounsbury, 1902, "Rep. Govt. Entom. for 1901," Cape of Good Hope, pp. 1–108; 6 plates. (2) Claude Fuller, 1902, "2nd Rep. Govt. Entom. (for 1901)," Natal, pp. 1–72; 2 plates and 26 text figs. (3) J. B. Smith, 1902, "Rep. Entom. Dept. New Jersey Agric. Coll. Experiment Sta. for 1901," pp. i–viii, and 463–587; 86 figs. (of which 15 are full-page). (4) Cecil Warburton, "Orchard and Bushfruit Pests, and how to Combat them," 1902 (Publ. R. Agric. Soc. England), pp. 1–20; 12 original text figs.

These Reports are all of the general character of those issued from time to time by their respective Governments. Beyond a brief note relating the introduction of natural checks for insect pests, the greater part of the Cape Entomologists' Report deals with Tick-Heartwater investigations, "Heartwater" being a disease, often fatal, of goats and sheep, supposed to be transmitted by a species of tick (*Amblyomma hebræum*). The Natal second Report forms a supplement to the first, with general remarks upon the year's work. We regret to learn that Mr. Fuller's engagement was originally for three years only, and that this may be his last Report. We trust that this may not be the case, but that more enlightened counsel may direct the Natal Government's policy. Mr. Fuller has our sympathy in the apathy of the Natal farmers and fruitgrowers. He made arrangements to deliver three lectures on insect pests, but the first two fell through from "want of time" at the meetings; at the third, which was specially arranged, two individuals turned up, "the President of the Association and myself." The people of the district certainly deserve the worst that may happen to them.

Dr. Smith's Reports are so well known that a lengthy notice is unnecessary. The major part of the present bulletin deals at length with the "Mosquito and Malaria" question. An account is also given of the attempts—largely successful—to naturalize the accidentally introduced Chinese Mantid—*Tenodera sinensis*. It is hoped that these predaceous, ever-hungry Orthoptera, which have actually reproduced in New Jersey while at large, will prove valuable allies against some of the worst insect pests of the State.

The Agricultural Society's Report is of a popular nature, no scientific names being employed, and deals with various orchard pests. It will doubtless be useful to fruit-growers.—G. W. K.

T. D. A. Cockerell. "The Classification of the Aleyrodidæ" (July 31, 1902), Proc. Acad. Nat. Sci. Philadelphia. Pp. 279–288. Plate xv.

Two genera of this rhynchotal family are acknowledged—*Aleurodicus* with thirteen species, all inhabiting the warmer parts of America (except one form from the Viti Isles, which Cockerell suspects was introduced upon *Psidium* from America); a new subgenus, *Dialeurodicus*, is formed for the thirteenth species. The second genus, *Aleyrodes*, is cosmopolitan; ninety-seven species are enumerated, distributed among five subgenera (three new). It would perhaps have been an improvement had full references been given; the list of species, however, is very useful, and forms a companion to the author's well-known Check-list of Coccidæ and first supplement thereto.—G. W. K.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] ***Marked * are bred; † are high flat-set.***

Duplicates. — Bractea. *Desiderata.* — Iris, Atropos, Convolvuli, Chryson, Barrettii, Ashworthii.—*B. L. Middleton; 5, Rathmines Park, Rathmines, Dublin.*

Duplicates. — A fine lot of well-set imagos on black pins. *Desiderata.*—Pupæ of Chaonia, Dodonæa, Dictæoides, Trepida, D. Furcula and Bifida, and other pupæ; larvæ of Dominula and Villica; ova of Io (or live females), Notha, Populeti, and many other good species. Exchange given.—*Thos. Salvage; Arlington, Berwick, Sussex.*

Duplicates. — Larvæ: Monacha and Pennaria. Bred: Castrensis, Camelina, Anachoreta, Illustraria, Angularia, Autumnaria, W-Album, Polychloros, and shortly ova or larvæ: Castrensis, Rusticata, W-Album, Rhamnata, Vetulata, Upsilon, &c.

Desiderata. — In early stages only: Ridens, Chaonia, Trimacula, Curtula, Lunaria, Orbicularia, Amataria, Alternata, Pulveraria, Propugnata, Sexalata, T. Cratægi, Prunata, Dotata, Suffumata, Chrysitis, Bajularia, Subumbrata, Trisignata, Pimpinellata, Hastata, Dodoneata, &c. Accepted offers answered by return. — *Colonel Partridge; 72, St. John's Park, Blackheath, S.E.*

Duplicates. — Larvæ of Plusia Moneta (Kent), during this month, or pupæ at end of May, will be reserved if desired. *Desiderata.*—Many good species in imago stage only, well set and on black pins (will promised correspondents please remind). —*A. J. Lawrance; 76, Samos Road, Anerley, S.E.*

Duplicates. — Larvæ of Dominula and Mundana. *Desiderata.*—Other larvæ and pupæ, especially Nolidæ, Pygmæola, Rubricollis, &c.—*W. Crocker:* 1, *Beaufort Villas, Avenue Road, Torquay.*

Duplicates. — During May, larvæ of A. Agathina. *Desiderata.*—Numerous.—*E. F. Studd; Oxton, Exeter.*

Duplicates.—Larvæ of Miniosa, Cruda, Leucophæaria, Progemmaria, Defoliaria, and Pilosaria.—*Desiderata.*—Many common insects—larvæ, pupæ, or imagines.—*E. A. Cockayne; 59, St. Giles, Oxford.*

Duplicates. — Foreign Lepidoptera in papers. *Desiderata.* — Coleoptera. — *E. Lane; 40, Fletching Road, Clapton, N.E.*

Duplicates. — Larvæ: P. Chrysorrhœa, H. Pennaria, E. Versicolora (from Rannoch). *Desiderata.*—Larvæ.—*M. A. Pitman; 11, Park Lane, Norwich.*

Duplicates.—Larvæ of Cæruleocephala and moderate imagines of Davus, Cursoria, Alsus, Salmacis, Tages, Chamomillæ, Piniaria, B. Quercus, Hyperanthus, Ægon, Strigillaria, &c. *Desiderata.*—Numerous, especially in early stages.—*S. A. Wallis; 64, Melton Road, West Bridgford, Nottingham.*

CHANGES OF ADDRESS.—H. W. Bell-Marley, *from* 60, Shaftesbury Road, Hammersmith, *to* Bayside, 50, Winder Street, Durban, Natal. A. E. Wright, *from* 60, Tentre Street, *to* 188, Todmorden Road, Burnley, Lancashire.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON (11, Chandos Street, Cavendish Square, W.).—Wednesday, May 6th, 1903, at 8 p.m. Paper to be read:—"Descriptions of twelve New Genera and Species of Ichneumonidæ, and three New Species of *Ampulex* from India, by Peter Cameron," communicated by G. A. JAMES ROTHNEY, F.E.S.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY (Hibernia Chambers, London Bridge, S.E.).—Meetings on the 2nd and 4th *Thursdays* in each month at 8 p.m.

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—The meetings of this Society (held at the London Institution, Finsbury Circus, E.C.) will take place on the 1st and 3rd *Tuesdays* in each month, from 7.30 to 10 p.m.

NORTH LONDON NATURAL HISTORY SOCIETY.—Meetings are held on the *2nd* and *4th Tuesdays* in each month at the Sigdon Road Board School (close to Hackney Downs Station, G.E.R.), at 7.45 p.m.

NONPAREIL ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY (17, Rahere St., Goswell Road, E.C.).—Meeting nights, 1st and 3rd *Thursdays* in each month.

VICTORIA HISTORY OF THE COUNTIES OF ENGLAND.—BEDFORDSHIRE.—Lists of, and Notes on, any Order of Insecta collected or observed in the county of Bedford will be gratefully received by H. Goss, The Avenue, Surbiton Hill, Surrey.

WANTED.

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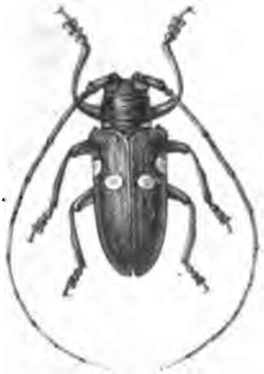
THE ENTOMOLOGIST

Vol. XXXVI.] NOVEMBER. 1903. [No. 486.

DESCRIPTION OF A NEW LONGICORN BEETLE FROM BRITISH EAST AFRICA.

By E. A. Heath, M.D., F.L.S.



Zographus balteatus.

Shining black. Pronotum thickly transversely striate, with a narrow elongate transverse cream-coloured spot on each side of base. The head is rugose, except in front, where it is smooth opaque. The antennæ in the male are about half as long again as the body. The basal joint is stoutest, slightly longer than the head, and coarsely granulated, the second joint being smoother, and twice as long as the first; the remaining joints shorter than the second, and almost subequal in length. The elytra are thickly and coarsely punctured, and obscurely pilose. The humeral angles are rounded and crenulate, with an obtuse tooth at its apex. A discal waved longitudinal carinate line, commencing near the posterior angle of the pronotum and terminating before apex somewhat near the elytral suture. Four rounded cream-coloured spots with reddish centre, two on each elytron; one a little before centre, near suture; the other near base, on the lateral margin. The body beneath, and the legs, somewhat longly pilose, with a transverse oval cream-coloured spot, and a smaller spot near its base, at the junction of the pro- and mesosternum; and two somewhat similar spots at the posterior margin of the mesosternum. The legs have a patch of light-coloured hairs on the upper and anterior edge of the femora, near base. The tibiæ are fringed with lightish hair on their posterior margins. Long. from head to apex of elytra 12 lines. Max. lat. 5 lines.

Hab. British East Africa.

PYRAMEIS CARDUI, *PLUSIA GAMMA*, AND *NEMOPHILA NOCTUELLA*.

By Robert Adkin, F.E.S.

The number of dull, rainy, or otherwise bad days during the month of September, 1903, rendered anything like a continuous record of the doings of so sun-loving a creature as *Pyrameis cardui* being kept; but such fragmentary notes as I was able to make regarding its appearance at Eastbourne during my stay there may be of some interest when taken in conjunction with other published observations.

Sept. 10th will long be remembered for its storm; the fresh westerly breeze of the morning southerned a few points during the later part of the day, and as night approached increased to a violent hurricane; the spray-laden wind swept along the coast, utterly destroying the more tender foliage, and even some miles inland the exposed sides of trees and hedges were browned and shrivelled as though they had been scorched; and its effect on insect life on our south and east coasts must have been equally disastrous. This was followed by fairly fine weather with calms and slight airs until the 17th, when a south-east breeze set in, and by the 19th had backed to east-south-east, and was blowing freshly, and so continued until the 21st.

Up to the 20th I had seen neither *cardui* nor *gamma*, but on that day I noticed one of the former and several of the latter feeding at the flowers planted in the gardens along the parades. On the 21st one *cardui* and increased numbers of *gamma* were seen in the same situation, and during a walk on the higher inland downs in the late afternoon the latter-named species was flying in great numbers, and feeding freely at bramble-blossoms, but no concerted flight in any particular direction was observable. The 22nd was overcast, with drizzley rain; on the 23rd a sea-fog obscured both land and sky, and on the 24th it still hung over the land, but less densely. Despite these adverse conditions, *gamma* was frequently seen about the flower-beds, and on the last-named date I kicked up a single example of *Nemophila noctuella* from a bit of rough grass at the end of the parade. The fog had melted away to a light haze on the 25th, with an overcast sky, and, although there was no bright sunshine, *cardui* were seen about the gardens by the sea.

The morning of the 26th broke dull, but by nine o'clock the sun was breaking through, and I lost no time in making my way to the sheltered hollows under Beachy Head, where, if any butterflies were to be found, I should surely find them. By the time I arrived there the sun was shining brilliantly, the lightest air drifted in from the sea, and the morning was positively hot. Such butterflies as one usually expects to find abundantly in this spot were, however, by no means so; *Lycæna corydon*, for instance, was represented by less than a score of individuals, and *Epinephele ianira* was seen to about the same number during the couple of hours that I spent there; but there was no lack of *cardui*, it was distinctly the most common butterfly, and was surpassed in numbers only by *gamma*, whose continued hoverings were simply bewildering, and *noctuella*, which rose from the grass at every step one took. Many of the *cardui*, as they fed at the knapweed-flowers or sat sunning themselves on the bare patches of ground, looked delightfully bright and fresh, but on catching several of them the wear of flight was only too apparent in the thinness of their scaling, and generally dull appearance when shaded from the bright sunlight. Even on this bright day an occasional wreath of fog would drift across, and during its passage not a wing was to be seen; even *gamma* would seek shelter until it had passed. This was my last chance of any extended observation, for on the next morning rain was falling, and, with the exception of the 30th, when I unfortunately had to be away, dull or rainy weather continued until my return on Oct. 2nd.

Several notes have already been published dealing with the appearance of *cardui* and *gamma* this autumn, and Mr. Barker has very kindly allowed me to see his remarks before publication. On comparing the dates given with the time when the south-east wind was prevalent, one cannot fail to be struck by the way in which they coincide. Thus, the wind became east on the 17th, and on the 18th the first *cardui* was reported (at Yarmouth); the wind freshened during the next few days, and *cardui* increased in numbers, and on the 21st eight examples were seen from a steamer between Yarmouth and Walton making their way towards the land. From the 21st to 26th the species was found in abundance at places on the coast so far apart as Suffolk and Sussex, and by this time some few had found their way as far inland as London, and this under conditions of weather that were by no means favourable for the movement or for the observation of a species that without bright sunshine is very likely to be overlooked.

The appearance of *gamma* coincides very closely indeed with that of *cardui*, and the abundance of *noctuella* above referred to is a factor that must not be disregarded. Both *cardui* and *gamma* are known migrants, and there is good reason for believing that *noctuella* should be included in the same category. Such evidence as we have with regard to this autumn's visitation may confirm Mr. Mathew's suggestion (*ante*, 267) so far as concerns the immediate cause, but we must look much further than the mere prevalence of easterly winds in our immediate neighbourhood for the primary cause, and I think the true solution will be found in the migratory habits of the species in question.

Lewisham: Oct. 17th, 1903.

PLUSIA NI AT PENZANCE.

By William Daws

(Late Curator of Porth Enys Museum).

I was interested in seeing Dr. Knaggs's account of this insect at Lynwood, near Penzance (*ante*, p. 217). The reason the late Mr. Baily did not make the matter known through the entomological magazines was that it had been hinted that he had introduced the species, and this caused him a great deal of annoyance. He told me he should keep quiet until someone opened the subject; then he would discuss it with them. I wish Dr. Knaggs had published his note sooner, as it would have given Mr. Baily a chance to place the facts before the public. *P. ni* was first taken at Lynwood by Mr. W. Beeton, who was staying there on a visit; he did not know anything about entomology, so used to bring in anything in that line that he found. I do not remember the number that was bred from larvæ brought in by the workmen; Mr. Baily gave a reward to them for each *P. ni* reared. Each man had a separate breeding-cage, with his name on; they collected all the green larvæ they could find feeding on the cabbages in their gardens. Some of the gardens were three-quarters of a mile from one another. Mr. Baily supplied several friends and collectors with specimens. I believe a pair that he gave to Mr. C. Briggs was sold at Stevens's for £4 1s. Through the kindness of Mr. Baily I have a series of four in my collection. The gamma-like mark in *P. ni* varies in size and definition. The larva of *P. ni* can easily be separated from that of *P. gamma*: it has a more slender appearance than the larva of *P. gamma*. The cocoon is quite white, and the pupa is black and not so robust as the pupa of *P. gamma*. Mr. Baily did not make a collection of pupa-cases or cocoons, so no care was taken of them; but I have three mutilated cocoons and pupa-cases from which some of the *P. ni* were bred. I believe the reason it was said that *P. ni* had been planted was due to the fact that either Dr. Knaggs or Mr. Baily sent for a foreign example of *P. ni* for comparison; but how was it possible to plant colonies of *P. ni* in several places from a dead example? Perhaps Dr. Knaggs could tell us who sent for that foreign example of *P. ni.* I think it came from Edmonds, of Windsor. I have this specimen also in my collection.

[Dr. Knaggs informs us that he wrote to Edmonds for a continental specimen of *P. ni* for comparison with the Penzance examples.

It may be interesting in this connection to quote Mr. Barrett's remarks on the history of British *P. ni.* He writes ('British Lepidoptera,' vi. 130):—"It is very little known here, and is apparently one of our rarest species, but there are rumours that it is not so scarce in the far west of England. The first specimen recorded in this country was captured flying about blossoms of red valerian by Mr. D'Orville in his garden at Exeter in August, 1868. The next was taken by Miss Carne, of Penzance, hovering at flowers in her garden in May, 1869, and was recognized by Mr. W. R. Jeffrey, in whose collection it still is. Of further captures in the same district, in both imago and larva state, definite information has been refused. The third recorded specimen was taken in Dorsetshire by Mr. Nevinson in 1885, and the fourth at the Isle of Portland, in the same county, in September, 1888, by Colonel Partridge, to whose lamp it was attracted while he was sugaring. In 1894 Mrs. Richardson found two larvæ in the same locality, from which the moths were reared early in September; and in the same year Mr. C. A. Briggs was allowed to exhibit two of the mysterious Cornish examples. The last of which I have any reliable information is a specimen taken sitting upon a fence at Norbiton, Surrey, in May, 1896, by Mr. Percy Richards; but there is a specimen in Dr. Mason's collection which may safely be held to be British, since it was found, overlooked, among a lot of the allied *P. gamma* in a British cabinet."

The American *Plusia brassicæ,* considered by Dr. Knaggs to be specifically identical with *P. ni,* and in this opinion we concur, is regarded as a pest in many parts of the United States. It was known to be seriously destructive to cabbages and other cruciferous plants in the Southern States some time before it was named and described by Riley in 1870. Since that time it seems to have extended its range north as far as Illinois and New Jersey. American entomologists state that the species is probably of somewhat remote southern origin. *Brassicæ* is rather larger in size and browner in colour than *ni,* and it would be interesting to know which form the Penzance specimens are referable to, as this might afford some clue to their origin.—Ed.]

DESCRIPTIONS OF FOUR NEW SPECIES OF *VESPA* FROM JAPAN.

By P. Cameron.

The four species here described were taken by Mr. George Lewis in Japan. I have had them marked as being undescribed for some years.

Vespa tridentata, sp. nov.

Black; the wings dark fuscous, with a violaceous tinge; the costa black, the nervures and stigma dark fuscous; the head, mandibles, the apices of abdominal segments one to five, and the whole of the sixth rufous; the hinder part of the vertex and the upper part of the outer orbits with an orange tinge. Antennæ black, the scape rufous, the flagellum brownish beneath. Legs black, the apex of the fore femora and their tibiæ rufous. ♀. Length, 25 mm.

Hab. Japan.

Head large, slightly wider than the thorax; the malar space distinct, moderately large; frontal plate wider than long, becoming gradually roundly narrowed to the apex, its base transverse, its centre with a narrow furrow. Clypeus strongly and closely punctured, its apex in the centre ending in a small, rounded, smooth tooth, with a much broader, longer, rounded one on either side. Mandibles rufous, the apex and teeth black; they are closely and strongly punctured. The hair on the head is fuscous, paler on the clypeus. Head and thorax covered with long dark hair. The apex of the prothorax dark rufous. The bands on the abdomen are broad and extend on to the ventral segments.

This species come close to *V. magnifica*, Smith, but that species is larger, the temples are longer compared with the eyes, the malar space is larger, the frontal area longer and more sharply pointed at the apex, and the reddish bands on the abdomen are much narrower.

Mr. Lewis captured at Hitoyoshi a queen *Vespa* which forms a well-marked variety of *V. magnifica*, var. *latilineata*, Cam. It is larger by 6 or 7 mm. than any of the recorded examples of *magnifica;* the bands on the abdomen are much wider, and the basal two segments are also broadly banded at the base. In having broad abdominal bands this variety agrees with *V. tridentata* here described, but the different form of the clypeus distinguishes that species.

Vespa xanthoptera, sp. nov.

Fulvous, tinged in places with yellow, the vertex from shortly behind the ocelli to the frontal plate, a line on the sides of the latter and a broader one below the antennæ, the occiput, mesonotum, a line on the centre and apex of the scutellum, the pleuræ, the metanotum, except the sides from near the top, the basal slope of the first abdominal segment, the mark narrowed in the centre and united to a broad transverse band, the second segment to shortly beyond the middle, the band with an irregular border on the apex, a broad band on the third, and a narrower one on the fourth, black. Legs coloured like the body, the anterior femora at the base below, and the four hinder coxæ, trochanters, and femora, black. Antennæ broadly black above, the scape yellow, the flagellum brownish below. Wings yellowish hyaline; the costal nervure black, the others fulvous. ♂. Length, 24 mm.

Hab. Michzusawa.

The entire insect thickly covered with long fulvous pubescence. Clypeus distinctly punctured, its length as long as the width at the apex, which is transverse; in the centre are three rufous marks in a triangle. The mark on the top is widened laterally and upwards, the centre slightly dilated. The black mark on the vertex is transverse behind, rounded in front. Mandibles with a distinct greenish tinge. Pronotum fulvous, as are also the tegulæ. The black lines on the abdomen are slightly dilated in the middle at the apex. Ventral surface for the most part blackish, the sides with paler marks; the penultimate segment is roundly incised in the middle, the incision slightly broader than long and extending to shortly behind the middle; the last segment is incised from side to side, the incision reaching to the middle; the last dorsal segment is slightly incised at the apex. Malar space moderately large.

Allied to *V. micado* and *auraria*. Characteristic is the form of the frontal plate, which does not become gradually narrowed towards the apex, but is broad and transverse there. The apex of the clypeus, too, is transverse, not incised as in the two species just mentioned. The male of *auraria* is not described by Bingham, but Saussure ('Vespides,' ii. 147) describes it "comme la femelle," so it should, apart from its smaller size, be easily separated from my species.

VESPA MICADO, sp. nov.

Rufo-fulvous, the ocellar region—the black in front reaching to the frontal plate, and only slightly developed behind the ocelli—the mesonotum, except for two lines extending from the base to shortly beyond the middle, the furrow on the scutellum, its apex, the base and centre of the post-scutellum, the base and centre of metanotum, the basal slope of the first abdominal segment, an interrupted transverse line near its base, and a broader one, dilated in the centre behind, near its apex, black. Front thickly covered with long black hair, the hinder part of the vertex and the thorax thickly covered with long fuscous hair. Wings fuscous-violaceous, the costa black, the nervures lighter coloured. ♀. Length, 27 mm.

Hab. Nagasaki.

Clypeus closely punctured, more strongly below than above, its apex with a slight broad incision, its sides broadly rounded. Frontal plate nearly as long as its width at the base; it becomes gradually roundly narrowed to the apex; the black mark is incised in the middle at its base. The clypeus and mandibles have a yellowish hue, the mandibular teeth and apex black. Antennæ coloured like the body, the scape slightly darker coloured than the flagellum. Temples slightly dilated from the base to the apex.

This species comes close to *V. bicolor*, but the colour is darker, more rufous, without any yellow tint; it is much larger and more robust; in *bicolor* the antennæ are black above, the upper part of the front, the vertex entirely, and the occiput are black; the frontal mark is transverse above, the clypeus is longer compared with its width, and the incision on its apex is deeper; the wings are clearer, more hyaline, and the pubescence darker. In the ground colour my species more resembles *auraria*, but that species is smaller, wants the black frontal mark, has the thorax for the greater part blackish, and the four hinder legs for the greater part black; also there is no yellow tinge on it.

VESPA FLAVO-FASCIATA, sp. nov.

Head orange-yellow; the occiput, except round the edges, a mark on the ocellar region, extending from shortly behind the ocelli, halfway down the front, the mark roundly narrowed before and behind; it is thickly covered with long blackish hair. Clypeus closely and strongly punctured, its apex roundly but not deeply incised; the sides are more deeply incised. Mandibles coloured like the head, with the teeth black. Frontal plate broadly rounded at the apex and furrowed down the middle. Thorax deep black, the pronotum dark rufous; the whole thorax is thickly covered with long dark fuscous hair. Abdomen sparsely covered with longish hair; the basal slope of the first segment black, the rest brown, darker on the apical half; the apex with a narrow yellow line; the basal two-thirds of the second brown, darker at the base, the apex slightly dilated in the middle; the base of the third is similarly coloured to shortly beyond the middle; the middle of the black band is produced to the base of the apical third, is obliquely narrowed, and has a rounded point on either side of the dilated middle, the rest being yellow; the other segments yellow, except that the fourth and fifth are narrowly brownish at the base, with a rounded projection on the sides; the second to fourth ventral segments are yellow at the sides, the blackish basal part projecting there as irregularly rounded knobs; the last segment is entirely yellow. Legs black, the apex of femora, tibiæ, and tarsi dark testaceous; the hair on the femora is long and black. Antennæ dark rufous. Wings hyaline, darker in the costal cellule; the nervures dark testaceous. Tegulæ dark testaceous. ♀. Length, 24 mm.

Hab. Nügata (Shinanogawa).

Comes near to *V. crabroniformis*, Sm., and *V. mongolica*, André. It has also some affinity with *V. crabro*.

Mr. Lewis has taken some specimens of a wasp which is clearly *V. japonica*, Saussure, non Sm. non Rad. This is the species, Col. Bingham tells me, which Smith (Trans. Ent. Soc. 1873, p. 198) quotes as *V. lewisii*, Saus. MS. *Vespa japonica*, Rad., is identical with *mandarinia*, Sm. Smith's *japonica* I do not know, and the name is not admissible, it being later than

Saussure's, which was described in Rev. et Mag. de Zool. (2), x. 1858, p. 261. The species recorded or known to me from Japan are:—*auraria*, Sm., = *simillima*, Sm.; *cincta*, Fab. (George Lewis); *crabroniformis*, Sm.; *ducalis*, Sm.; *flavo-fasciata*, Cam.; *japonica*, Saus.; *japonica*, Sm., non Saus.; *magnifica*, Sm., var. *latilineata*, Cam.; *micado*, Cam.; *mongolica*, André; *norwegica*, Fab.; *siberica*, André; *tridentata*, Cam.; *xanthoptera*, Cam.; or fourteen species in all. Thirteen species of *Vespa* are recorded by Bingham from British India, but to these must be added *V. germanica*, Fab., which I have seen from the Khasias. Thus the number for both regions is the same. *V. affinis*, F., and *V. bicolor*, F., probably extend into Japan.

TWO NEW JAMAICAN CULICIDÆ.

By Fred. V. Theobald, M.A.

The following descriptions of two new mosquitoes are drawn up from specimens sent to the British Museum (Nat. Hist.) by Dr. Grabham, and taken by him near Kingston. The new *Culex* is very distinct, as also is the *Hæmagogus*, which is so far the most beautiful Jamaican mosquito yet found. The type-specimens are in the Museum collection.

Genus Culex, Linn.

(Syst. Nat. 1735; Theob. Mono. Culicid. i. p. 326, 1901.)

Culex tortilis, n. sp.

Head golden scaled; proboscis unbanded; thorax adorned with golden scales, and a large dark brown patch on each side in front, the back of the mesonotum also darkened; pleuræ with grey scales. Abdomen deep brown with violet reflections; the second, third, fourth and fifth segments with narrow basal pale bands; venter pale yellow scaled. Legs deep brown, unbanded; venter of femora and coxæ white. Ungues equal.

♀. Head brown, clothed with narrow-curved golden-yellow scales, a few black bristles, and ochraceous upright forked scales; proboscis and palpi deep brown; antennæ brown; basal joint testaceous; second joint very *large and swollen*, deep brown. Thorax deep brown, the middle of the mesonotum clothed with narrow-curved golden scales; on each side in front a roundish rich deep brown patch, and the posterior part of the mesonotum with darker scales than the front, being almost brown, but not so dark as the front lateral areas; scutellum with dull golden-brown scales and brown border-bristles; metanotum bright chestnut-brown; pleuræ pale brown, with spots of grey scales. Abdomen black in some lights, rich deep but dull violet in others; the first segment with dusky scales, forming two spots and pale golden hairs; the second, third, fourth and fifth segments with narrow pale yellowish basal bands, not extending quite across the segments, the fifth sometimes very inconspicuous; basal lateral white spots most prominent on the apical segments; venter clothed with creamy yellow scales; border-bristles of the dorsum pale golden. Legs deep brown, except the coxæ and venter of the femora, which are grey to creamy yellow; femora, tibiæ, and hind metatarsi with black bristles; hind metatarsi very nearly as long as the hind tibiæ; fore and mid ungues equal, uniserrated; hind equal and simple. Wings clothed with typical brown *Culex* scales; fork-cells rather short; first submarginal cell very slightly longer, but narrower than the second posterior cell, its stem about as long as the cell, its base about level with the base of the second posterior cell, if anything slightly nearer the apex; stem of the second posterior cell not quite as long as the cell; posterior cross-vein very short, about twice its own length distant from the mid; a pale spot at the base of the wing; halteres testaceous. Length 4 to 4·5 mm.

Hab. Kingston, Jamaica.

Time of capture. August.

Observations.—Described from a series of females taken by Dr. Grabham. They are very distinct, small, thick-set mosquitoes, easily told by the thoracic adornment, the two dark spots on the front of the mesothorax being very characteristic; their unbanded legs at once separate them from *Culex secutor*, Theob., or *C. janitor*, Theob., and they are of much stouter build. When alive they can easily be identified by the character noticed by Dr. Grabham, of carrying their hind legs twisted right forward over their head, when settled, after the manner of *Wyeomyias*. There is some variation in the venation. Some specimens show the base of the first submarginal cell slightly nearest the apex, and the posterior cross-vein as long as the mid cross-vein, and about its own length distant from it. In others the basal abdominal banding is very faint; in one there is a *trace* of an additional basal abdominal band.

Genus HÆMAGOGUS, Williston.

(Trans. Ent. Soc. Lond., 1896, p. 271, Williston; Mono. Culicid. ii. p. 238, Theob.)

Hæmagogus equinus, n. sp.

Head metallic violet, white between the eyes in front; palpi and proboscis black; antennæ pale brown. Thorax metallic green; pleuræ snowy white. Abdomen bright metallic violet, with three prominent and one faint silvery white basal bands and white lateral spots. Legs unbanded, deep brown; femora white beneath. Wings with violet reflections, iridescent.

♀. Head clothed with flat metallic violet scales, except a patch between the eyes, which are white, and at the sides, where they are grey and black; black bristles project over the eyes, and there is a trace of a narrow pale border surrounding them; clypeus with a frosty sheen; palpi black; proboscis black, curved upwards, nearly as long as the whole body; antennæ pale brown, basal segments deep brown, with dusky scales on the large basal and second segments. Thorax black, covered with large flat apple-green metallic scales, rounded at their apices and irregularly disposed over the mesonotum; a patch of almost silvery white ones just in front of the roots of the wings, with also long dense black bristles; scutellum with flat green and blue scales and black border-bristles; prothoracic lobes and pleuræ silvery white. Abdomen rich metallic violet; the first segment with an oblique white line on each side; the second and third unadorned; the fourth with a few large basal white scales; the fifth, sixth and seventh segments with basal white bands; border-bristles short, black; each segment with a large basal silvery white lateral spot; venter pure silvery white; each segment with a median black spot, the last two segments projecting downwards, and giving the appearance of two ventral black tufts. Legs unbanded, deep brown, with metallic violet reflections, and a pale knee spot to the mid and hind pair; femora white beneath; ungues small, equal, and simple. Wings faintly tinged with brown, metallic violet and iridescent in certain lights; first submarginal cell slightly longer and narrower than the second posterior cell, its base nearer the apex of the wing, its stem longer than the cell; stem of the second posterior longer than the cell; posterior cross-vein rather more than its own length distant from the mid cross-vein; halteres with ochraceous stem and fuscous knob. Length, 4–5 mm.

Hab. Kingston, Jamaica, W.I.

Time of capture. August (24th).

Observations.—Described from a single perfect specimen. Dr. Grabham took this brilliant species feeding on a horse. He took two specimens, and mentions that "it is by far the most brilliant species found here, and evidently uncommon." It was taken at 7 p.m. at the lower end of Old Pound Road. It resembles *H. cyaneus*, Fabricius, but the venation is different, the first submarginal cell being smaller, and having its base nearer the apex of the wing, whilst in *cyaneus* it is nearer the base; moreover, the abdomen is adorned. It also approaches *H. albomaculatus*, Theob., but the abdomen has not the curious chætotactic characters seen in that species (*vide* fig. 171, p. 309, Mono. Culicid., vol. iii.) and is banded, not having the two median spots seen in *albomaculatus*.

The three species of *Hæmagogus* tabulate as follows:—

A. Abdomen unadorned. Base of first submarginal cell nearer base of wing than the base of the second posterior cell . *cyaneus*, Fab. = *splendens*, Willis.

AA. Abdomen adorned.
  a. Base of first submarginal cell nearer apex of wing than that of posterior cell.
  b. With prominent chætæ and two median basal white spots . . . *albomaculatus*, Theob.
  bb. No prominent chætæ, but basal white bands and a white oblique stripe on each side of first segment . . . . . *equinus*, Theob.

A LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI; WITH A FEW NOTES.

By C. Seymour Browne.

(Continued from p. 256.)

It is rather remarkable that the Rhopalocera are not more varied in proportion to the Heterocera, of which I shall be able to mention about 400. One butterfly, which escaped me, and which I could not name, would be all I could at present add further to my previous list.

I am greatly indebted to Sir George F. Hampson, Bart., who has most kindly named a great many of my specimens. I may also mention that Signor Antonino Mazzarella, of Anacapri, can supply most of the Lepidoptera mentioned in my list.

Several boxes of set specimens sent to England, owing to the tender mercies of the post, met with disastrous results; and, as I have been unable to resend several duplicates (papered next time), the list will be short of a few names, which I will add as opportunity occurs.

It has been noticeable that during the driest part of the summer few Lepidoptera have been about, and the darkest nights have not been nearly so productive as the few dark hours before the rise of the moon when about full.

Lycænidæ (omitted from last list).

580. *Lampides telicanus*, Lang. Common in autumn.

Sphingidæ.

717. *Acherontia atropos*, Linn. Common on the mainland, but only two specimens taken, autumn, 1903. One of these moths flew on board a ship I was travelling in, off Livorno, about six miles from land, end of November, 1901.

735. *Protoparce convolvuli*, Linn. Common.

752*a*. *Deilephila lineata*, Esp., var. *livornica*, Esp. One specimen, 1902; two, summer, 1903.

759. *Chærocampa elpenor*, Linn. Scarce.

868. *Macroglossa stellatarum*, Linn. Very common. N.B.—There should be many more Sphingidæ found here, but I have been too much occupied in the early evenings to give them much attention. I hear of many varieties taken on the mainland.

Notodontidæ.

781*a*. *Cerura bifida*, Hb., var. *urocera*, Bois. Rare.

785. *Dicranura vinula*, Linn. Scarce.

858. *Phalera bucephala*, Linn. (see previous note, *ante*, p. 255).

Lymantriidæ.

929. *Lymantria dispar*, Linn. Very common.

LASIOCAMPIDÆ.

956. *Malacosoma neustria*, Linn. Common.

970*f*. *Lasiocampa quercus*, Linn., var. *spartii*, Hb. Rare.

1000. *Odonestis pruni*, Linn. Scarce.

SATURNIIDÆ.

1084. *Saturnia pyri*, Schiff. Very common in May. Others of same family should be found here, but have not noticed any.

NOCTUIDÆ.

1152. *Agrotis pronuba*, Linn. Very common.

1153. *A. orbona*, Hufn. Rare.

1154. *A. comes*, Hb. Scarce.

1345. *A. puta*, Hb. Very common, and is one of the first moths to appear.

1387. *A. obelisca*, Hb. Fairly common in autumn.

1400. *A. segetum*, Schiff. Very common. The markings vary.

1402*a*. *A. saucia*, Hb., ab. *margaritosa*, Hw. Common.

1425. *Pachnobia faceta*, Tr. Four specimens, spring, 1903.

1484. *Mamestra glauca*, Hb. Scarce.

1514. *M. serena*, Fabr. Fairly common.

1544. *Dianthœcia magnolii*, Bois. Scarce.

1599. *Bryophila muralis*, Forst. Common.

1599*b*. *B. muralis*, Forst., var. *par*, Hb. Commoner than *B. muralis*.

1664. *Hadena solieri*, Bois. Very common this autumn ; a nuisance when working with an acetylene lamp.

1715. *H. secalis*. Scarce. Specimens taken in the spring.

1846. *Callopistria purpureofasciata*, Piller. Only one specimen, summer, 1902.

1848. *C. latreillei*, Dup. Two specimens, summer, 1903.

1867. *Brotolomia meticulosa*, Linn. One specimen, October, 1903 (see note in previous list).

1913. *Tapinostola musculosa*, Hb. Fairly scarce.

1942. *Leucania scirpi*, Dup. Very common.

1946. *L. punctosa*, Tr. Very common.

1954. *L. l-album*, Linn. Common.

1957. *L. loreyi*, Dup. Scarce.

1961. *L. vitellina*, Hb. Fairly scarce.

1990. *Caradrina exigua*, Hb. Occurs all through the season, but common in spring.

2005. *C. selini*, Bois. Scarce.

2019. *C. ambigua*. Common, autumn.

2183. *Xylomyges conspicillaris*, Linn. Several specimens last spring.

2325. *Heliothis peltigera*, Schiff.

2327. *H. armigera*, Hb. Both fairly common, *armigera* occurring later than *peltigera*. Both show distinct shadings from red-brown to greenish.

2361. *Xanthodes malvæ*, Esp. Only one specimen, 1902.

2380. *Acontia luctuosa*, Esp. Very common.

2429. *Thalpochares parva*, Hb., and

2449. *T. scitula*, Rbr. Both fairly common.

2490. *Emmelia trabealis*, Sc. Common, spring and early summer.

2496. *Metoponia vespertalis*, Hb. Fairly scarce.

2557. *Plusia chalcytes*, Esp. Fairly scarce.

2562. *P. gamma*. Linn. Very common.

2571. *P. ni*, Tr. Nearly as common as *gamma*.

2644. *Grammodes algira*. Difficult to get perfect specimens.

2670. *Catocala elocata*, Esp. A few specimens.

2720. *Apopestes spectrum*, Esp. If the broom is searched many pupæ can generally be found in early summer, together with *L. quercus* var. *spartii*.

2728. *A. dilucida*, Hb. Fairly scarce.

2748. *Toxocampa craccæ*, Fabr. Fairly common.

2797. *Herminia crinalis*, Tr.

2818. *Hypena obsitalis*, Hb. Quantities can be taken in any dark place used for storing brushwood, but have not taken any at light.

2820. *H. lividalis*, Hb. Occasionally found on walls, and comes to light at night.

(To be continued.)

CURRENT NOTES.—No. 2.

By G. W. Kirkaldy.

(Continued from p. 264.)

To W. F. Fiske (2) we are indebted for an extensive study of the hymenopterous parasites of *Clisiocampa americana*. Primary parasites, hyperparasites of the primary ones, secondary parasites, and hyperparasites of the secondary ones, are all discussed at length. "In the beginning of the series of collections and breedings it was supposed that the parasites would be found to exert considerable influence on the prevailing numbers of their host; that is to say, in the case of *Clisiocampa americana*, for instance, that the parasites would be found to be one of the more important of the factors which governed the abundance of this species from year to year. But investigation failed to confirm this theory. . . . In 1896 it was exceedingly common, . . . and it was consequently assumed that its parasites would also have increased to such an extent as to be a considerable factor in bringing about a more normal condition in 1897. But, strangely enough, this reasoning was found to be diametrically opposite to the facts of the case. In 1896 a great many caterpillars were destroyed by *Limneria fugitiva*, and numbers of the characteristic cocoons of this species were collected and bred. . . These proved to be in their turn almost entirely the prey of *Pimpla inquisitor*, and the breeding-cages in which the cocoons were confined becoming filled with the adults of the hyperparasite, it was . . . . given credit for the destruction of large numbers of tent-caterpillars. Thus it was the *Limneria* which proved to be the real victim, and, as its cocoons were rare, the next year the primary host, *Clisiocampa americana,* was indirectly but decidedly the gainer. . . . The parasites, as a body, were found to exact a certain tithe of blood, so to speak, and, this being obtained, would proceed to fight over its possession, passing it from one to another, from parasite to hyperparasite, until often, perhaps, there would be little more than enough left of a single large caterpillar than that sufficient to support a single small chalcid." The annual percentage of caterpillars of *Clisiocampa* destroyed by parasites, Fiske estimates at about 15 to 20 per cent. *Pimpla inquisitor* (Say) and *P. conquisitor* (Say) seem to have the peculiar faculty of being both primary and secondary parasite of the same host. "Though it is doubtful if in nature the following sequence ever takes place, there is no reason why it should not, as all the species mentioned are normally parasitic on the next preceding:—

Host	. *Clisiocampa americana.*
Primary parasite .	. *Limneria fugitiva.*
Secondary parasite .	. *Pimpla conquisitor.*
Tertiary parasite .	. *Theronia fulvescens.*
Quaternary parasite	. *Dibrachys boucheanus.*
Quinquenary parasite	. *Asecodes albitarsis.*"

O. W. Barrett (3) discusses the Antillean Mole Cricket. The habits of this destructive orthopteron appear to be similar to those of the European *G. gryllotalpa.* The damage to crops in Puerto Rico by the Changa amounts to probably more than £20,000 sterling annually, the crops injured most being cane, tobacco, and rice; comparatively little damage is done in clayey soil, moist sandy loam being preferred, while saturation and extreme dryness of the soil prevent the mole cricket's operations. Remedies are discussed, with notes on the few natural enemies.

H. Schouteden (4) continues his interesting contributions to our knowledge of Aphidæ. The present one is to a certain extent a compilation, but is nevertheless valuable, consisting of a list of various plants, with the name of their aphidocecids under each. A second list follows of genera and species of Aphidæ, with the plants (under each) on which they produce the galls. Several new forms are described.

(To be continued.)

NOTES AND OBSERVATIONS.

Lophopteryx carmelita.—Whilst collecting about the middle of August in West Kent, I found a larva of *L. carmelita* crawling up a large beech tree. I thought it might have wandered from a neighbouring birch, but on offering it that food and beech it selected the latter. I had no opportunity of visiting the locality again, but my friends Messrs. Cope and Blest went there and took ten more larvæ between August 18th and 27th, all in similar positions, *viz.* crawling up the trunks of beech-trees. Boisterous winds were prevalent at the time, and the larvæ had undoubtedly been blown off the trees. The last one spun up on Sept. 11th. I was previously unaware that the larvæ of *L. carmelita* fed on beech, or that they were to be found so late as the end of August and beginning of September; and I have never known this insect to be double-brooded.—Edwin Goodwin; Canon Court, Wateringbury.

The Hybernation of Dasychira fascelina.—While on a visit to Rannoch in the summer of 1901, I found on July 15th three larvæ of *D. fascelina* about three-quarters of an inch in length. Two of the larvæ were in slight silken cocoons between stones, one amongst some which formed a small cairn. The other, also in a hybernaculum, was concealed in a thick tuft of heather. The larvæ, on removal, did not eat any food. When disturbed they would curl up and remain without moving for hours, and would then spin a fresh house. On Aug. 1st they had eaten large holes in the muslin covering of their box, using the scraps to spin into their cocoons. Two larvæ died in November, the third survived till the following March, sleeved out in the garden. This year, early in July, on the same hillside, I obtained another larva of *D. fascelina* of the same size and spun up like the three former ones, and which, in spite of being kept in a hot room and supplied with fresh food, has hybernated without eating or moving up to the present date—October 4th. Cases of larvæ hybernating over two winters in captivity are not uncommon, but I have not seen a record in the case of wild larvæ. The causes of hybernation are very obscure, and for the invertebrates have been insufficiently studied. But if we accept the usual explanation, *i. e.* unfavourable conditions, especially cold and hunger, then some instances are easily explicable. Larvæ indoors are of necessity in an unnatural environment, and something in the conditions in which they are being kept may easily induce them to extend their period of hybernation. In 1901, however, everything was apparently favourable; the weather was particularly hot, and food abundant. Thinking that some parasite might have been the cause—though this usually acts as a stimulant—I carefully examined the bodies of the dead larvæ, but found no trace of any. The explanation must be sought elsewhere. It is possible that a cold week at the time when the larvæ usually begin feeding may have induced this curious lengthening of torpidity. It certainly may well have been the cause this season, for a colder and more inhospitable spring has not been experienced in the district for many years.—E. A. Cockayne; Sheffield.

Some Aberrations of Butterflies.—Among various aberrations of butterflies sent for examination by Mr. E. Sabine of Erith, the following seem to be of interest:—A female specimen of *Pieris napi*, bred in the spring of the present year. The example is of full size, but on the under side of the hind wings there is a curious partial absence of dark shading to the venation; this only extends along the nervures, and about half-way along the first median nervule, is rather faint. Of *Euchloë cardamines* there is a female specimen with two longitudinal irregular streaks on the under side of the hind wings, extending from just inside the cell almost to the outer margin of the wing. This was taken at Darenth last May, and on the day it was captured only one other female and two males of this species were seen. Two specimens of *Vanessa urticæ* reared from larvæ have unusually vivid blue outer marginal spots; these spots are larger than normal, and somewhat wedge-shaped. Several more or less aberrant specimens of *Chrysophanus phlœas* were bred in July this year. One is of a pale golden colour; two others are dark copper, tinged with purple on the basal half; one of the latter has rather large blue spots before the band on the hind wings; a fourth specimen has abnormally long tails. The best variety, however, of *phlœas* is a female example in which spots 1, 2, 3, and 5 of the submarginal series are extended inwards, forming conspicuous black bars; 2 and 3 unite with the outer discal spot. This aberration agrees very closely with an example figured in Entom. xxix. 191. An interesting point in connection with these aberrations of *C. phlœas* is that the females from which the ova were obtained are described by Mr. Sabine as "exceedingly commonplace."

CŒNONYMPHA IPHIS IN BRITTANY: A CORRECTION.—We have seen the specimens recorded from Brittany by Mr. Denis Turner as *Cœnonympha iphis* (*ante*, p. 246), and find that they are not examples of that species but of *C. arcania*. The error in identification is to be regretted, and with such an insect as *C. arcania* should not have occurred.

ABERRATION OF ARCTIA CAIA.—Mr. F. Hind, of Nottingham, found an unusually pretty aberration of *A. caia*, resting under a hedge in August last. The specimen is normal in every respect, except that the ordinary cream-coloured markings of the fore wings are bright yellowish buff, similar in tint to the hind wings of *A. villica*, but perhaps hardly so yellow.

VAGARIES OF THE SEASON.—I can add some further information to the interesting note on this subject (*ante*, p. 267), for on Monday, Sept. 21st, I found a full-grown larva of *Arctia caia* feeding on groundsel, which spun up in three days. *Epinephele ianira* was still flying here—more than one, on Friday, Oct. 9th.—HUGO HARPUR CREWE; Stanleys, near Brockenhurst.

ABRAXAS GROSSULARIATA: SECOND BROOD.—In the October number of the 'Entomologist' I recorded the fact of a larva of this moth spinning up for pupation on Sept. 21st (*ante*, p. 266). I am glad to record that it pupated, and that the moth emerged some time during the night on Oct. 13th. The pupa remained for two weeks outdoors, and for the other six days was kept in a warm room. The perfect insect is a small one, as I expected from the size of the pupa, but is a pretty specimen, having the third series of usually sub-confluent spots on the fore wings almost forming an intensely black transverse band.

The hind wings are light, but not unusually spotted. Since taking the larva that produced this specimen, in the garden, I have found about two dozen pupæ, and quite two dozen larvæ, now nearly all pupated, hanging on various plants and on the fences particularly, south side. I have been daily expecting some of the moths to emerge, but they have not done so yet, though kept in a warm room. *A. grossulariata* has had a remarkable life this year, as the mildness of the fore part of the spring brought on some of the larvæ very early, and consequently there was a partial early emergence in June; then the wet and cold set in and kept the rest emerging until very late. No doubt the pupæ and full-fed larvæ now to be had are the progeny of the early imagines. I took the last pupa, outdoors, on Oct. 22nd. It is worth noticing that this second brood have fed on unusual plants and trees, as the currant and gooseberry bushes were, in my absence, almost stripped of their foliage by the sawfly (*Nematous ribesii*). I have taken the larvæ off plum-trees, apple, raspberry canes and strawberry, though the greatest number were feeding or spun up on young shoots of old black currant-bushes, which I had to cut down owing to another great pest of this neighbourhood—the black currant mite or gall-fly. —Ed. G. J. Sparke; Tooting Bec Road, S.W., Oct. 23rd, 1903.

[In a note dated Oct. 28th, Mr. Sparke writes: "Another *A. grossulariata* emerged this afternoon about 3 o'clock."—Ed.]

Yellow Colouring of Cocoon of Plusia moneta.—In reply to Mr. Bird's note (*ante*, p. 242), I may state that I have tried the effect of moisture on the cocoons of *P. moneta*, and with various results. In two cases submersion had no apparent effect on the cocoons, while in other cases the cocoons changed to yellow of various shades. Nearly all these experiments were carried out with empty cocoons; the two which did not change colour, however, were white, and comparatively fresh, but moths did not emerge from them owing to the specimens dying after the pupæ had been formed, but whether before or after submersion I cannot say. Mr. F. M. B. Carr, of Salisbury, informs me that he reared four larvæ of *P. moneta* (from Northwood, Middlesex), one cocoon of which is pure white, two dirty white, and one almost entirely yellow. All these four larvæ were kept in a glass-bottom box about two inches in diameter and one and a-half inches deep, and the cocoons were all spun on the side or top of the box. I shall feel obliged if Mr. Bird will let us know how one of these cocoons obtained more moisture than the others. Mr. E. M. Holmes, of Sevenoaks, wrote me last August concerning *P. moneta* as follows:—"All my cocoons this year were exceptionally pale, but five that spun up the first week in June were absolutely white" (these, I understand, changed colour after submersion in water). This fact would seem strange if the presence of moisture caused the cocoons to change to yellow without actual submersion, for we certainly have not had a dry spring this year. Mrs. Holmes has obtained (by submersion) a change in the colour of three-year-old cocoons.—Raleigh S. Smallman; Carlton House, Herne Hill, S.E., Oct. 9th, 1903.

Vespidæ.—I am making a study of the above, and especially of *V. crabro* (the hornet), but have experienced a great difficulty in getting specimens of the species. Can any of your readers help me by giving localities where they can be found? To be of use to me in dissecting they must be freshly caught or alive.—Herbert H. Clarke; Watlington House, Sidcup, Kent, Oct. 6th, 1903.

Geometra vernaria.—I read Mr. Russell's article (*ante*, p. 227) with great interest; I obtained a quantity of these larvæ in the spring by beating. One thing I noticed, which may only have been chance: all the males spun up and emerged at least ten days before any of the females. I should like to know if Mr. Russell had the same experience.—Herbert H. Clarke; Sidcup, Kent.

Eupithecia togata.—The strong winds which prevailed in Scotland towards the end of August had the effect of making the larva of this insect an easy capture. When in Argyleshire, in a locality where a single imago was taken four years ago, I found the ground strewn with spruce cones, many of which contained larvæ. Nearly every cone, however, had been more or less completely eaten by squirrels in the two days which had elapsed since the gale had brought them down, and I should fancy that a large proportion of larvæ must have been destroyed.—John A. Nix; Oct. 5th, 1903.

Sirex juvencus at Weybridge.—This beautiful species has been emerging in some numbers during the past month from a fir-tree which was felled and split up at Weybridge, Surrey. As notices are often published of the occurrence of *S. gigas* in different parts of the country, and I have seen it stated that *juvencus* is the more abundant of the two, I should like to mention that in my experience *S. gigas* is by far the more common in Britain. Every year I hear of many of the latter appearing in different places, but not so with *juvencus*, having only occasionally received specimens or notices of its occurrence.—F. W. Frohawk.

CAPTURES AND FIELD REPORTS.

Vanessa antiopa in the Isle of Wight.—In the 'Field,' Sept. 26th, W. T. records having seen, on Sept. 17th, a specimen of *V. antiopa* fly past him quite close, but not having a net was unable to capture it. Before he saw it, a friend of his had watched the butterfly for several minutes, and as it pitched several times close to him, he was able to identify it without difficulty.—F. W. F.

Species of the Genus Plusia in Kent. — Apropos of the notes on the scarceness of *P. chrysitis* I may say that at Sidcup, during last July, I could have taken without any great trouble a dozen or two a night, flying over bramble and other flowers; I procured ova from one of them, the larvæ appeared in due time, and a good proportion fed right up, and the perfect insects are now emerging. I took *P. pulchrina* at the same time, and from the ova obtained one hundred and forty larvæ, but from some unexplained reason they all died when about half an inch long. *P. gamma* at the present time is flying in great numbers.—Herbert H. Clarke; Sidcup, Kent.

Leucania loreyi in South Devon.—A specimen of this excessively rare British moth was captured by me at Torquay (at sugar) on Sept. 27th, 1900.—**Alfred E. Holdaway**, Lonouli, Newton Abbot, Oct. 26th.

Chrysopa aspersa and C. flava at Balham.—On June 21st last I took two specimens of *Chrysopa* off a fence at Balham. These, on examination, proved to be *C. aspersa* and *C. flava*. From their condition at the time I should say that the insects had just emerged.—W. J. **Lucas**; 28, Knights Park, Kingston-on-Thames.

Sphinx convolvuli in Ireland.—While dusking on the evening of Sept. 6th last, in Ireland, I took two specimens of *S. convolvuli* at flowers of *Nicotiana affinis*. They are unfortunately both very worn.—F. W. Y. **Jackson**; 2, Vicarage Gate, Kensington, W., Oct. 11th, 1903.

Sphinx convolvuli and Chærocampa nerii in Warwickshire.—I had brought me yesterday a lovely male specimen of *C. nerii*. It was found at rest on a yew cut hedge in a gentleman's garden on the outskirts of the town. Evidently it had just emerged, and is in perfect condition. This does not agree with Newman's theory that one now and again is blown over from France; it could hardly have got to the middle of Warwickshire by that method. A fortnight ago I had a male *S. convolvuli* brought me, found at rest on a door in a close yard in the middle of the town.—**Chas. Baker**; 25, Long Street, Atherstone, Oct. 10th, 1903.

Chærocampa celerio at Brighton.—I have just received a specimen of *C. celerio* from Mr. F. Trangmar, of Brighton. It was captured on October 24th last at the Brighton railway works by Mr. J. Clayton, who caught it with his hands, and consequently the specimen is slightly rubbed.—H. **McArthur**; 35, Averill Street, Fulham Palace Road, W., October 26th, 1903.

Phibalapteryx fluviata (gemmata) at Chichester.—Seeing but few notices of this pretty little geometer, and as it is the first time that I have ever seen or taken it alive, it may be interesting to record the capture of a female specimen at a gas-lamp here on Sept. 22nd last.—**Joseph Anderson.**

Notes on Lepidoptera at Chichester, 1903.—In common with very many collectors of Lepidoptera, my experience has been that of a succession of bad seasons, this has been absolutely the worst which I ever remember. I began sugaring early in June, and on the 8th of that month took *Dipterygia scabriuscula* for the first time in this locality. On July 18th *Mania maura* first made its appearance, and at the end of the month *Apamea unanimis* and *Hadena didyma*, the latter varying greatly. I also took *Miana literosa*. *Zeuzera pyrina* (*æsculi*) occurred in August. In September *Agrotis suffusa* and *Xanthia gilvago* came to sugar.—**Joseph Anderson.**

Lucanus cervus at Chichester.—This fine beetle has been somewhat abundant here this season.—**Joseph Anderson.**

Acronycta alni in Hampshire.—On August 12th last a larva of this scarce moth was found and brought to me by the daughter of one of my gardeners, who noticed it on a hazel bush not far from this house. Unfortunately it proved to be "ichneumoned," and died in a few days.—**Hugo Harpur Crewe**; Stanleys, Brockenhurst, Hants.

Pieris daplidice, &c., at Folkestone.—On July 6th of this year, while collecting *Lycæna bellargus* at Folkestone, I took a female specimen of *P. daplidice*. One hind wing is slightly chipped, but otherwise it is in very fair condition. I found *L. bellargus* fully out, and *L. minima* was abundant. I think it is unusual for *minima* to be out at the same time as the first brood of *bellargus*, and July 6th is a late date for the latter species.—**F. Kingsman**; 47, Parkstone Road, Peckham, S.E.

Leucania vitellina, &c., at Lewes.—During a recent short visit to Lewes I captured a specimen of *L. vitellina* at sugar (Sept. 27th). It is not in very good condition, being somewhat rubbed. *Noctua xanthographa* was very common in the same locality, and I also noticed *Noctua c-nigrum* and *Anchocelis lunosa*. On the 26th I sugared at another spot about a mile from where I took the *L. vitellina*, and took several *Agrotis suffusa* and *A. segetum*. *Anchocelis pistacina* was also seen, and numbers of *Phlogophora meticulosa*. On one patch I counted sixteen of the latter, besides other species. In the course of a long walk on the 27th I noticed a good many *Vanessa cardui* and *Plusia gamma*, and netted a series of *Stenopteryx noctuella* (*hybridalis*), and at dusk *Crambus inquinatellus* was taken. The total bag for one day and two evenings was about forty specimens.—**Philip J. Barraud**; Bushey Heath, Herts.

Pyrameis atalanta at Light.—I have to record the capture of a *Pyrameis atalanta* while flying round an acetelene gas-lamp at about ten o'clock last night in Wallington. I have never heard of this species being taken in this way before, though I have noticed two or three specimens of *Pyrameis cardui* inside the lamps during the last two months. Both species have been exceedingly abundant here this year, especially the first-named, and it was not at all an uncommon thing to see from four to seven of this beautiful butterfly settling on an old sugar patch in the morning.—**Leslie H. Morse-Robinson**; Wandle Bank, Wallington, Surrey, Oct. 20th, 1903.

Pyrameis cardui at Electric Light.—At the Clapham electric lights two specimens of *P. cardui* were taken on September 17th at ten o'clock at night, and another specimen on the 18th.—**H. G. Webster**; 147, Elsley Road, Lavender Hill, S.W., Oct. 8th, 1903.

Pyrameis cardui, &c., in Kent.—I have seen this insect in almost every lane and field round here for miles during September, and over one field of mustard they absolutely swarmed; had I been so disposed I could have captured them by hundreds. *Polia flavocincta* also, at the time of writing, literally swarms at sugar. *Mania maura* in July seemed to be very plentiful, flying into the house at dusk.—**Herbert H. Clarke**; Sidcup, Kent, Oct. 8th, 1903.

Pyrameis cardui and Plusia gamma.—The following note may be of interest with regard to the appearances of these two insects. I went to Great Yarmouth, Norfolk, on Sept. 9th, and stayed there until the 21st of that month. Up to Thursday the 17th the weather was very stormy, the wind being very high and blowing chiefly from the north-west, but it moderated on the 17th, and in the evening of that day, at dusk, I saw the first *Plusia gamma*, flying over bramble blossom at Great Ormesby. The next day, Friday the 18th, when the wind changed nearly due east and remained in this quarter until I returned, and was very stormy, I noticed several *P. gamma* flying around the flower-beds in the gardens on the sea-front at Yarmouth, and one *Pyrameis cardui*, which appeared a little worn. On Saturday the 19th, there were several *P. gamma* on the North Denes, and in the course of the day I saw three *P. cardui* about the town and gardens. The next day, Sunday, I noticed two *P. cardui* flying in one of the gardens near the sea-front as early as half-past six in the morning, and saw six or seven during the day, all more or less worn. Later in the morning I was walking across the North Denes and noticed *Plusia gamma* there in hundreds, although, as previously stated, there were only a few on the day before. There were no *P. cardui*, but several were seen, on my return to the town, flying around and sitting on the flowers in the gardens of the houses. I returned by boat on the 21st, and the wind was blowing half a gale, but between Gorleston and Walton I saw eight *P. cardui* pass over the boat as they flew towards the shore. I did not reach Walton until half-past four, as the boat was delayed two hours owing to a break-down, or I might have been able to have seen others on landing; the last I saw was flying around the pier at Walton. I might add that several *P. cardui* have been taken in Nunhead Cemetery and brought to me, all more or less worn and damaged; and I have seen it at Brockley and in my own garden at Peckham, but I think this is common knowledge, as it has occurred around London pretty generally. In South Square, Gray's Inn, the other morning there was an example of *Pyrameis atalanta* sunning itself on the wall of the buildings.—H. W. Barker.

SOCIETIES.

South London Entomological and Natural History Society.—*August 27th*, 1903.—Mr. E. Step, F.L.S., President, in the chair.—Mr. R. Adkin exhibited a variety of *Limenitis sibylla* in which the white markings were somewhat reduced in size and partially obscured by a dusting of black scales, together with a var. of *Cleora glabraria* in which the basal third of the fore wings was very dark. Both were from the New Forest.—Mr. Step, the very large Heteropteron, *Belostoma grande*, from Trinidad, where it is known as the "Electric Eel."—Mr. West, the three British representatives of the Heteropterous genus *Pilophorus*, all from Oxshott, viz., *P. cinnamopterus* on pines, *P. perplexus* and *P. clavatus* on oak.—Mr. Hare, a variety of *Acidalia aversata* with the posterior half of both fore and hind wings suffused with fuscous.—Mr. Dodds, several curiously streaked male specimens of *Ocneria dispar*. He had inbred the species for the last three seasons, and had not previously met with this variation. The streaks were the colour of the female, and very far from being symmetrical.—Mr. Garrett, a male specimen of *Porthesia similis* (*auriflua*) only half the usual size, taken at Wimbledon, and a female

Polyommatus corydon with several blue marks along the costa of the right fore wing, forming a broken streak. It was taken at Purley.—Mr. West and Mr. Ashby reported that they had been warned out of the open sandpit on Oxshott Heath, while searching for Coleoptera, because "it interfered with the birds getting their evening meal."—Mr. F. M. B. Carr, (1), a collection of Lepidoptera made this season in the Salisbury district, including *Eugonia polychloros*, *Nemeobius lucina*, *Lithosia sororcula* (*aureola*), *Gastropacha quercifolia*, *Notodonta dictæa*, *Plusia moneta*, *Eurymene dolabraria*, *Cleora lichenaria*, *Minoa euphorbiata*, &c.; (2), a bred example of *Cabera pusaria* var. *rotundaria*; and (3), a series of *P. moneta* bred from Northwood larvæ, together with yellow and white cocoons. He said that white cocoons dipped in water became yellow. He also noted that some sixty males of *Orgyia antiqua* had assembled to a bred female in two days.

September 10*th*.—The President in the chair.—Mr. Garrett exhibited a specimen of *Pyrameis atalanta*, with the red submarginal band of the hind wings marked with yellow spots. It was bred from Arundel larvæ.— Mr. Goulton, a larva of *Coleophora limosipennella*, found feeding on birch at Oxshott, and also photographs of various larvæ, including *Cucullia verbasci*, *C. lychnitis*, *Jocheæra* (*Acronycta*) *alni*, *Pterostoma palpina*, &c.—Mr. Adkin, a series of *Zonosoma linearia*, reared from West Sussex ova. He referred to the varieties exhibited, and pointed out a specimen in which occurred a small wedge-shaped dark mark extending inwards from the central line of the fore wings.—Mr. Main, examples of three species of New Zealand butterflies, including *Pyrameis gonerilla*, the close ally of our *P. atalanta*.—Mr. Carr, larvæ of *Melanthia albicillata* and *Cosmotriche potatoria*, and stated that he had a larva of the latter species which apparently intended to go over a second winter. A discussion ensued.—Mr. West (Greenwich), a series of the Homopteron *Gargara genistæ*, which he had taken on broom at Oxshott. At first the males were in great preponderance, but later on the females were much the more numerous.—Mr. Clark, photographs of the ova of *Gastropacha quercifolia*.—Mr. Carpenter recorded the fact of the pairing in captivity of bred *Pararge egeria* by Mr. Joy. They were enclosed in a band-box covered with leno and exposed to the full sun.

September 24*th*.—The President in the chair.—Mr. South exhibited (1), a short series of *Aplecta nebulosa*, bred from Delamere Forest larvæ, received from Mr. Thompson; all were darker than the typical form, but only two were var. *robsoni*; (2), a series of *Cabera pusaria*, reared from larvæ obtained from Oxshott, Wisley, and Epping; most of the specimens resembled var. *rotundaria* in marking, but only a few of them agreed with that form in the shape of the wings.—Mr. Goulton, bred series of *Orgyia antiqua* and *Emmelesia unifasciata*.—Mr. F. B. Carr, (1), a bred series of *Malacosoma neustria*, from New Forest ova; all were brown in colour, half the males pale and half the same shade as the females; (2), a larva of *Cleora glabraria*, taken in the New Forest at Easter, and still feeding.—Mr. Boxer, a collection of butterflies and moths from Durban. — Mr. West (Greenwich), short series of three species of Hemiptera taken from broom at Oxshott in September—*Livilla ulicis*, *Dictyonota strichnocera*, and the rare *D. fuliginosa*.—Mr. Lucas read the report of the Horsley Field

Meeting held on June 6th, and illustrated his remarks with lantern slides.—Hy. J. Turner, *Hon. Rep. Sec.*

RECENT LITERATURE.

A Catalogue of the Coccidæ of the World. By Mrs. Maria E. Fernald, A.M. 8vo, pp. 360. Amherst, Mass.: Carpenter & Morehouse. 1903. (Hatch Experiment Station of the Massachusetts Agricultural College; Bulletin No. 88.)

Until comparatively recent years there were few students of this important family of homopterous insects, and there has been no general monograph of the Coccidæ since Signoret's series of papers on the family were concluded in the 'Annals' of the Entomological Society of France, about thirty years ago. During the last ten years or so considerable attention has been given to Coccids. Professor Cockerell, among others, has added very extensively to our knowledge of the family, and has done much valuable work in clearing up many of the intricate points in synonymy. A few books on the subject have been produced, and of these we may mention Green's 'Coccidæ of Ceylon' (i., 1896, ii., 1899), and Newstead's 'Monograph of the British Coccidæ,' vol. i. of which was published by the Ray Society in 1901. Altogether a vast amount of literary matter has accumulated, and awaits the monographist. In the meanwhile the excellent Catalogue before us should prove a veritable boon to everyone in any way interested in Coccid literature. Upwards of fifteen hundred species are enumerated, the references are most comprehensive, and, we should suppose, would enable one to get in touch with almost everything that has been written on the subject from the year 1758 down to the end of February, 1903.

Mrs. Fernald has carried out a laborious and somewhat difficult undertaking in an exceedingly able manner.

OBITUARY: CLAUDE A. PYETT.

The death is announced of a promising young entomologist, Mr. Claude A. Pyett, of Ipswich, whose name will be familiar to readers of the 'Entomologist' as the contributor of Notes on the Lepidoptera of South-west Suffolk. Mr. Pyett, who was of colonial extraction, chose the profession of a journalist, and in the brief intervals of leisure which that somewhat exacting career affords devoted his attention to scientific and artistic pursuits. He possessed the rare gift of taking careful and accurate notes of his observations, and was always ready to place his knowledge of the insect-fauna of the Ipswich district at the disposal of his fellow-workers. Mr. Pyett was no mean artist, and many sketches from his pen have appeared as illustrations to his articles and reports in the press of the Eastern Counties. It is to be feared that he overtaxed a somewhat fragile frame during the Newmarket election campaign of last year. An attack of typhoid fever left him in a very weak condition, and he passed away at his home at Ipswich on October 2nd, the actual cause of death being syncope.

EXCHANGE.

Duplicates.—Ianthina,* Nebulosa, Herbida,* Unanimis,* Ochracea,* Leucophea (fair), Literosa, Baja, Camelina,* Solidaginis, Cerago,* Silago,* Nictitans, Gemina, L. Comma, Umbrosa, Comes, Unca, Fuscula, Antiqua,* Testacea, Fulva, H. Sylvinus (few), Morpheus, Arenosa, Advena (3), Suspecta, Suffusa, Verbasci* (4), Lignata,* Piniaria,* Russula,* Cæsiata, Subfulvata,* Rivata,* Autumnaria,* Tiliaria,* Quercinaria,* Illustraria,* Fuscantaria,* Immutata, Ulmata, Boreata, Pudibunda,* Pavonia (males), Trifasciata,* Olivata (4), &c. *Desiderata.*—Pruni, Athalia, Globulariæ, Culiciformis, Myopiformis, Apiformis, Albulalis, Muscerda, Complana, Gonostigma, B. Trifolii, Abietaria, Roboraria, Orbicularia, Degeneraria, Ruficinctata, Eupethiciids, Turca, A. Ligustri, Auricoma, Myricæ, Cucullina, Petasitis, Pastinum, Rufata, Rufa, Munitata, Simulata, &c.—*T. Ashton Lofthouse; The Croft, Linthorpe, Middlesbrough.*

Duplicates.—Ova of Tiliaria, Protea, and Comes. Larvæ: Rumicis, Margaritaria, Bisetata (few), Aversata (from banded female), Piniaria. *Desiderata.*—Ova, larvæ, and pupæ: Prunaria, Occulta, Acidaliids. Pugs, &c.—*T. Ashton Lofthouse; The Croft, Linthorpe, Middlesbrough.*

Duplicates.—Autumnaria* (Folkestone), Illustraria,* var. Æstiva,* Tiliaria,* Fulvata (3), Æscularia (male only), Dilutata, Monacha* (3), Hectus, Impura, Popularis (male only), Nictitans (4, fair), Capsincola,* Proboscidalis, Sericealis (4). *Desiderata.*—Bombyliformis (narrow), Pyralina, Festucæ, Xerampelina, Cynipiformis, Typhæ, Chamomillæ, and many others. Good specimens; black pins only. —(*Miss*) *A. D. Edwards; The Homestead, Coombe Hilt, East Grinstead.*

Duplicates.—Fine Eup. Extersaria.* *Desiderata.*—Fine Iris, Pruni, Arion, Bombyliformis, Scoliiformis, Testudo, Rubricollis, Abietaria, Degeneraria, Tæniata, Consignata, Plumbeolata, Irriguata, Fluviata, Lapidata, Picata, Obliquaria, Bifida, Nubeculosa, Chaonia, Dodonea, Auricoma, Fluctuosa, Ocularis, Cinerea, Cannæ, Cæsia, Empyrea, Atriplicis, Conformis, Lychnitis, Bractea, Notha, Peltigera, Ashworthii, Subsequa, Conspicillaris, Alpina, and others. Only accepted offers answered.—*E. A. Atmore: King's Lynn, Norfolk.*

Duplicates.—Bred Angularia, Anachoreta, Orion, Illustraria, Dolobraria, W-Album, Rhamnata, Castrensis, Monacha, Io, Abruptaria, Polychloros, Cervinata, Aversata, E. Autumnaria, Trilinearia, wild Ægon var. Corsica, Valligera, Lunosa, Littoralis, Nigra, Ægon, Z. Minos. Accepted offers answered by return. *Desiderata.*—Pupæ: Liturata, Alternata, Succenturiata, Valerianata, Subumbrata, Pygmæata, Satyrata, Castigata, Trisignata, Virgaureata, Fraxinata, Campanulata, Expallidata, Assimilata, Exiguata, Togata, Sparsata, Hastata, Rivata, Propugnata. &c.—*Colonel Partridge;* 72, *St. John's Park, Blackheath, S.E.*

Duplicates.—Numerous, especially in Geometridæ; also a number of Tortrices. *Desiderata.*—A. Cratægi, Aurinia, Cinxia, Athalia, C-Album, Epiphron, Megæra, Pruni, Ægon (Northern only), Salmacis, Artaxerxes, Actæon, Palamon, Pilosella (Irish), Undulanus (not New Forest), Mesomella, Deplana, Caniola, Rubricollis, Menthastri (Northern), S. Urticæ, M. Castanea, Fascelina, Gonostigma, T. Cratægi, Fluctuosa, Ridens, Coryli.—*Richd. South;* 96, *Drakefield Rd., Upper Tooting, S.W.*

Duplicates.—Ashworthii (almost black), Lubricipeda, Anachoreta (St. Leonard's), Fuscantaria, Rubidata, and others. *Desiderata.*—Plantaginis var. Hospita, Rotundaria, Prataria, Innotata, Constrictata, Stevensata, Reticulata, Bicuspis, Ocellaris, Auricoma, Concolor, Favicolor, Caliginosa, Pyrophila, Satura, Gnaphalii, Dentalis, Terrealis, Stachydalis, Margaritalis, Unionalis, Littoralis, Pulveralis, Myellus, Fascelinellus, Adelphella, Farrella, Bistriga, Augustella, Bankesiella, Cephalonica, Ceratoniæ, Mucronellus, Alpina, Festaliella, Pilosellæ, &c.—*George T. Porritt; Edgerton, Huddersfield.*

Duplicates.—Hera (S. Devon), Arion (Cornwall), Sibylla, Ripæ, Exulans, Tritici, Vestigialis, Puta, Flavicincta, Boreata. *Desiderata.*—Cinxia, Athalia, Epiphron, W-Album, Pruni var. Artaxerxes, var. Salmacis, Paniscus, Atropos, Convolvuli, many Sesiidæ, Globulariæ, Geryon, Chlorana, Bicolcrana, Albulalis, Centonalis, Senex, and many others.—*A. E. Gibbs; Kitchener's Meads, St. Albans.*

Duplicates.—Io, Edusa, Rhamni, Cucullatella, Caja, Potatoria, Similis, Testacea, Pyramidea, C-Nigrum, Gothica, Incerta, Stabilis, Pistacina, Circellaris, Oxyacanthæ, Protea, Sambucata, Pennaria, Luridata, Rupicapraria, Marginaria, Dilutata, Elutata. *Desiderata.*—Numerous.—*R. M. Kirk; Droitwich Rd., Worcester.*

Duplicates.—A. Ravida, Comes,* Verbasci.* N. Comma, Lutosa, Impura, Testacea, Bembeciformis,* Phragmitidis, Literosa, Suasa (2). *Desiderata.*—Lychnitis, Asteris, Tridens, Leporina, Pyrina, Bondii, Aquilina, Argentula, and many other Noctua. Black pins, with data.—*R. Chapman;* 58, *Paisley Street, Newington, Hull.*

Duplicates.—Paphia, Adippe, Euphrosyne, Blandina, T. Rubi, Corydon, H. Comma, Batis (3), Brunnea,* Nebulosa, Fimbria,* Dahlii, Vaccinii, Margaritaria, Marginata, Albicillata, Tristata, Lariciata, Populata,* Palumbaria, &c. *Desiderata.*—Epiphron, Paniscus, Ridens, Orion, Furuncula, Captiuncula, Ripæ, Opima, Populeti, Ochroleuca, Fuscula, Bractea, Palpina, Hamula, Cassinea, Vespertaria, Advenaria, Fasciaria, Trilinearia, Sylvata, Immutata, Inornata, Conspicuata, Affinitata, Derivata, Hastata, and numerous others.—*W. C. Wells; Oscott Villa, Wylde Green, near Birmingham.*

Duplicates.—Lucernea, Hispidus, Putrescens (fair), Interjecta (fair), Nigra, Litura, Satellita,* Ambigua, Ianthina, Typica,* Camelina, Viridata, Candidata, Imitaria. Ova: Nigra. Larvæ: Hispidus. *Desiderata.*—Irrorella, Muscerda, Aureola, Pygmæola, Deplana, Cribrum, Monacha, Fascelina, Gonostigma, B. Rubi, Furcula, Bifida. Larvæ, pupæ, and good unset Exotics, or offers.—*J. Walker; 3, Goodwin Terrace, Bronshill Road, Torquay.*

Duplicates.—Obfuscata (fair), Occulta (fair), Brunneata (fair), Blandina, Hispidus, Muralis, Ambigua, Leucophæaria, Hera (4, chipped), Haworthii (fair). *Desiderata.*—Numerous.—*E. A. Cockayne; 6, Tapton House Road, Sheffield.*

Duplicates.—Unidentaria, Corylata, Cæsiata, Crepuscularia, Cassiope, Sylvanus, Agestis, V. Salmacis, and Canadian Antiopa, Cardui, Huntera, C-Album, &c. *Desiderata.*—Orbicularia, Trigeminata, Holosericata, Subsericeata, Fumata, Pictaria, Plumbeolata, Pygmæata, Pimpinellata, Coronata, Debiliata, Firmata, Rivata, Fluviata, Albovenosa, Impudens, Reticulata, Hispidus, Corticea, Ripæ, Leucographa, Miniosa, Diffinis, Chrysozona, Moneta. All specimens to be perfect, black pins, and full data.—*C. E. Morgan; 43, East Mount, Barrow-in-Furness.*

Duplicates.—T. Quercus,* Quercana* (2), Fimbria, Pudorina, Pinastri, Viminalis, Nupta, Plecta, Megacephala, Silago,* Cerago,* Gilvago,* Oleracea,* Upsilon (3), Mendica,* Typica, Suspecta, Popularis, Pastinum (2), Duplaris, Rubricosa, Cruda, Unca, Potatoria (light variety, males), Autumnaria,* Angularia,* Prodromaria* (fine), Taminata. *Desiderata.*—B. Rubi, Agathina, Fluctuosa, Pruni, and many others. All specimens to be perfect. Lists exchanged.—*W. E. Baker; Tilney All Saints, King's Lynn.*

Duplicates.—Typica, S. Populi,* S. Ligustri,* B. Quercus, Rubricosa, Instabilis (dark), Stabilis, C. Nigrum, Lunosa, Fimbria,* Meticulosa, Festiva, Aprilina, Suffusa, Testacea, Segetum (fine), Saucia, Lithargyrea (4), N. Rubi (3), Suspecta, Puta (50), Plecta, Filipendulæ, Rumicis (4), Megacephala (4), Ulmata, Cæsiata, Elutata (fine moorland forms), Testata (dark), Illustraria,* Boreata (males), Progemmaria (fairly dark), Corylata, Quercinaria,* Blandina, Machaon* (6), Io,* Sibylla, Edusa, Aglaia (6), Cardamines (4), Urticæ,* T. Quercus (6), Rhamni (4). Few Hispidus, Anomala, Lucernea, Putrescens (for special insects). *Desiderata.*—Simulata, Griseata, Rufata, Papilionaria, Bicolorana, Smaragdaria, Chlorana, Muscerda, Ligniperda, T. Cratægi, B. Trifolii, Orion, Putris, Scolopacina, Abjecta, Unanimis, Lunigera, Ophiogramma, Agathina, Præcox, Hyperborea, Croceago, Oo, Nana, Flavicincta (variable), Genistæ, Lychnitis, Chamomillæ, Lunaria, Roboraria, Vernaria, Dolobraria, black forms of Abruptaria, pupæ or larvæ of Gonostigma and Anachoreta.—*W. Tunstall; Brook House, Meltham, near Huddersfield, Yorks.*

Duplicates.—Ambigua* (6), Hispidus* (6), Anachoreta* (6), Dominula* (6), Triangulum,* Ianthina* (4), Fimbria* (4), Lucipara* (6), Stellatarum,* Luctuosa (4), Hera (6, worn), Saucia, Suffusa, Pisi (3), Umbratica (4), Hepatica, Trapezina, Rufina, Oxyacanthæ, Plecta, Puta, Nigra (6), Lithargyra, Festiva. *Desiderata.*—Local species. Pupæ and ova.—*Alfred E. Holdaway; Newton Abbot, South Devon.*

Duplicates.—L. Favicolor, one or two for types. *Desiderata.*—S. Pinastri, Galii, Centonalis, Cænosa, Lapponaria, Polygrammata, Reticulata, Sicula, Bicuspis, Strigosa, Vitellina, Palustris, Alpina, Barrettii, Gnaphalii, &c. Only accepted offers replied to; on approval on both sides.—*G. F. Mathew; Dovercourt, Essex.*

Desiderata.—Gemina (the light northern form). Will do my best in return Send list of desiderata.—*Postmaster; Frindbury, Rochester*

Duplicates.—Io,* Salicis,* Cerago,* Silago,* Croceago,* Chenopodii,* Maura, Conigera, Rhizolitha, Subnotata,* Nemoralis (few). *Desiderata.*—Muscerda. Succenturiata, Valerianata, Minutata, Simulata, and many others.—*A. U. Battley; Kingsfield, Hunters Forstal, Herne Bay.*

Desiderata.—Pupæ of A. Rumicis for scientific experimental purposes. Will give very liberal exchange in imagines or other pupæ—*V. E. Shaw; Salisbury Road, Bexley, Kent.*

Duplicates.—Abruptaria,* E. Autumnaria,* Impluviata, Remutata, Crepuscularia, Biundularia, Incanaria, Sororcula, Cruda, Macilenta, Gothica, Lunosa, Instabilis, Actæon. *Desiderata.*—Many common insects in good condition to extend.—*J. A. Finzi; 58, Hamilton Terrace, London, N.W.*

Duplicates.—Cardamines (3), Edusa (2), Hyale (8), Aglaia (2), Artemis (5), Semele (4), Tithonus (4), Quercus (5), Alexis, Alveolus, Sylvanus, Populi, Tiliæ,* Russula (males), Monacha (2), Neustria (4), Fasciaria (3), Illustraria* (2), Bidentata* (4), Pennaria (2), Abruptaria (4), Incanaria, Petraria, Strigillata (4), Citraria, Gilvaria (fair), Æscularia (4), Dilutata, Nanata (4), Albicillata (2), Galiata (6), Tersata (3), Populata (4), Lineolata (6), Plecta (3), Triangulum (3), Gothica (5), Gracilis (3), Gilvago (4), Trapezina, Capsincola (4), Adusta (4), Dentina (3), Fuscula (6, fair). Also many of last month's list. *Desiderata.*—Numerous.—*A. H. Shepherd; 81, Corinne Road, Tufnell Park, London, N.*

Duplicates.—Notha, Pulveraria, Advenaria, Sphinx, Sinapis, Selene, Decolorata, Bicolorata, Rupicapraria. *Desiderata.*—Furcula, Bifida, Fagi, Trepida, Dahlii, Bondii, Elymi, Haworthii, Xerampelina, Depuncta, Berberata, and very many others.—*H. A. McNaught; 2, Chatley Villas, Claines, Worcester.*

Duplicates.—Good series of Galleria, Mellonella,* Macularia, Ochrearia, Bidentata* (dark), Quercinaria, Pennaria, Cæruleocephala, P. populi,* Flavicincta (and ova) and Miata; also a few of many others. *Desiderata.*—Putris, Gemina, Citrago, Adusta, Glauca, Rectilinea, Lunaria, Biundularia, Punctularia, Virgularia, Ornata, Gilvaria, Hippocastanaria, Filigrammaria, Alchemillata, Albulata, Simulata, Tristata, Fluviata, Vetulata, Paludata, Statices, Chlorana, Cucullatella, Mendica, Hectus, Dromedarius.—*James Douglas; Dunollie, Sherborne, Dorset.*

Duplicates.—Selene (6), Artemis (4), Blandina, T. Rubi (3), Caia,* Chrysorrhœa,* Neustria,* Perla, Rumicis, L. Comma, Impura (4), Augur (4), Plecta (3), Brunnea,* Festiva, Xanthographa, Gothica, Rubricosa, Stabilis, Instabilis, Gracilis, Cruda, Macilenta, Rufina, Litura, Vaccinii, Spadicea, Satellitia. Cerago,* Silago (6), Ferruginea (6), Oxyacanthæ (6), Meticulosa, Lucipara, Margaritaria, Pilosaria, Petraria, Atomaria, Rupicapraria, Leucophæaria, Dilutata, Cæsiata, Immanata (5), Palumbaria, Chærophyllata (6). *Desiderata.*—Numerous; well set on black pins. *G. Fleming; 9, Fairview Terrace, Merthyr Tydfil.*

Duplicate.—1 Arion. *Desiderata.*—Pruni or Palæmon; fine specimens only. *F. A. Oldaker; Parsonage House, Dorking.*

Duplicates.—Brassicæ,* Urticæ,* Atalanta, Malvæ, Thaumas, Lineola (fair), Sylvanus, Geryon (fair), Jacobææ (pupæ), Perla, L. Comma, Exclamationis, Lunosa, Glyphica, Sambucaria, Ornata, &c. *Desiderata.*—Foreign specimens of Daplidice, Latona, Bœtica, Argiades and Semiargus, Typhon, Asiliformis, Culiciformis, Globulariæ, several Footmen, Hera, Mendica, Urticæ, Ligniperda, Pyrina, Gonostigma, Lanestris, Potatoria, Biniara, &c. All to be fine specimens, well set on black pins, with data. Lists exchanged.—*F. A. Oldaker; Parsonage House, Dorking.*

Duplicates.—A. Alni (bred, 1890). *Desiderata.*—Edusa var. Helice, Acis, Scoliiformis, Exulans, Loniceræ, Centonalis, Muscerda, Sericea, Caniola, Straminecola, Lanestris, Castrensis, Sicula, Bicuspis, Curtula, Ocularis, Obsoleta, Maritima, Cannæ, Brevilinea, Petasitis, Scolopacina, Abjecta, Albicolon, Furva, Ophiogramma, Captiuncula, Caliginosa, Lunigera, Cinerea, Aquilina, Agathina, Simulans, Ashworthii, Depuncta, Stigmatica, Conflua, Dahlii, Umbrosa, Subsequa, Leucographa, Gothica, Suspecta, Xerampelina, Cæsia, Exulis, Semibrunnea, Gnaphalii, Interrogationis, Orichalcea, Arbuti, Dipsacea, Umbra, Luctuosa, or any other rare or local species.—*A. O. Jones, Senr.; care of Mr. Lawrence*, 76, *Samos Road, Anerley, London, S.E.*

Duplicates.—Two hundred fine Radiata var. of Lubricipeda: a few almost black and extremely fine, for special offers.—*W. Tunstall; Brook House, Meltham, near Huddersfield.*

Wanted.—Pupæ of Lepidoptera, any species, living or dead; empty cases would suffice, if not too much broken.—*Charles Mosley; Lockwood, Huddersfield.*

Duplicates.—Absinthii (imagines and pupæ), Philanthiformis (imagines). *Desiderata.*—Many imagines. Black pins.—(*Rev.*) *J. S. Puckridge; Castlemartin Vicarage, Pembroke.*

ENTOMOLOGICAL SOCIETY OF LONDON (11, Chandos Street, Cavendish Square, W.).—Wednesday, November 4th, 1903, at 8 p.m. Paper to be read:—"On some Aberrations of Lepidoptera," by PERCY I. LATHY, F.Z.S.

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THE ENTOMOLOGIST

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A NEW BRITISH FLEA, *CERATOPHYLLUS DALEI*, sp. nov.

By The Hon. N. Charles Rothschild, M.A., F.L.S.

Plate V.

In our article, "Types of Siphonaptera in the Daleian Collection,"* we pointed out that Mr. C. W. Dale possessed a single male specimen of a flea taken from the nest of a wood-pigeon (*Columba palumbus*) which, in our opinion, represented a very distinct new species.

Mr. Dale, however, considers the insect in question to be identical with *Ceratophyllus columbæ* (Walcken. & Gerv.) † We do not agree with Mr. Dale, and take this opportunity of describing the species and naming it in his honour.

This insect is allied to *C. gallinæ* and *C. fringillæ*. It is, however, much paler in colour even than the latter-named species. The more strongly chitinised portions of the exoskeleton and those parts which cover each other are more or less pale yellow in colour in the mounted specimen. The abdominal tergites are brownish above, the prothoracic comb being deep brown. The head is very similar to that of *C. fringillæ*, being somewhat longer in proportion and a little more evenly rounded. The pronotal comb consists of twenty-seven teeth. The epimerum of the metathorax bears six fine hairs, one at the apex, three arranged in a row from the stigma downwards, and two more near the base. The legs are markedly different from those of *C. fringillæ*, the spines on the back of the tibiæ and fifth tarsal segments being much stouter.

The eighth tergite (fig. 1) of the abdomen is modified in a special way. Its distal edge is almost vertical, being slightly sinuate. The tergite, moreover, is produced upwards, and is

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* Ent. Mo. Mag. (Ser. 2), vol. xiv. p. 146 (1903).

† Walcken. & Gerv. Hist. Nat. Ins., Aptères iii. p. 375 (1844).

strongly rounded. The long bristles at the edge of the segment are very numerous, some nineteen being situated close together, the most ventral hair only being separated from the next by a larger interspace. The eighth sternite (fig. 3) bears, close to the apex, three long bristles on each side, besides one ventral bristle which stands close to the others, and which is a little shorter and thinner than the rest. On the lateral surface of the eighth sternite there is a row of extremely small hairs, the hair nearest the apical bristles being the longest. The sternite ends apically in a large hairy membranous flap. This flap is very different from those found in *C. gallinæ* and *C. fringillæ*, but its exact outline cannot, unfortunately, be made out from the slide. There is only one long bristle near the insertion of the movable finger (fig. 2, F.). The finger (fig. 2, F.) is somewhat similar in shape to that of *C. gallinæ*, it is completely rounded at the apex, and differs conspicuously from the allied species in the size and arrangement of the bristles. There is one bristle at its apex, being about as long as the finger is wide in the middle. Close beneath it there is a short pointed spine followed by a spine-like bristle which is about half the length of the long apical one. A similar bristle is placed further down. Length 2·7 mm.

The type and only known specimen of this new species was taken by Mr. C. W. Dale, at Glanvilles Wootton, Dorsetshire, from the nest of a wood-pigeon, some years since.

PROBABLE ORIGIN OF CORNISH *PLUSIA NI.*

By H. Guard Knaggs, M.D., F.L.S.

In the November number of the 'Entomologist,' p. 277, an editorial note occurs to the effect that "*Plusia brassicæ*, Riley, is rather larger in size and browner in colour than *P. ni*, and that it would be interesting to know to which form the Penzance specimens are referable, as this might afford a clue to their origin."

Let me first call attention to papers in 'The Entomologist's Annual' for 1868, pp. 67–8, and note, p. 96, and for 1869, pp. 68 and 69, and note, p. 82, wherein my old friend the late Frederick Smith, of hymenopterous fame, gives an account of a wasp of the genus *Polistes* which was caught by a lady at Penzance in the summer of 1866, and again in 1867. Three specimens were taken and several others were seen at the same time, and my friend remarked upon the close resemblance to *Polistes biguttatus*—a South American insect—and suggested the possibility of its being an imported species.

Mr. Smith says that his correspondent undertook to make every enquiry as to what vessels had entered the harbour from America. In July last he received the following information:—

"After trying in vain to obtain any intelligence of shrubs or unsawn wood being imported from South America, a remark of my sister's turned my thoughts in another direction. She told me that the common wasp was often very troublesome to butchers by its taste for raw meat. Now there is a regular trade between Penzance and South America in raw hides, and it occurred to me as possible that the South American wasps might have settled on the hides, and so have got wrapped up and entangled in them. It was also ascertained that the ship conveying the hides arrived at Penzance on the 25th of July, 1866, and the *Polistes* was captured about 15th August. In 1867 the same ship entered the port of Penzance on 31st of July, and the *Polistes* was again taken during the first week of August." The captain of the vessel, when interrogated about the wasp, said they "no doubt came from his ship, as he had seen hundreds about it when sailing down one of the branches of the La Plata."

"The explanation," Mr. Smith thought, "fully accounted for the capture of the *Polistes*, and at the same time suggested a way by which many carrion beetles may be conveyed to this country in a way that might not occur to entomologists who pick up such insects in the neighbourhood of Penzance, as well as near ports in other parts of the country." He also mentions that Mr. Douglas captured the same species of *Polistes* at St. Katharine's Docks, and Mr. Nicholas Cooke took another in the office of a wool warehouse at Liverpool.

My own opinion is that *P. ni* (*brassicæ*, Riley) came over with *Polistes;* it is common in Brazil and other parts of South America, and it is this insect which is becoming such a nuisance in the States: the conditions were there for making the voyage. We know that moths and caterpillars do find their way on board vessels, and cocoons may be made up in wool or hair. No captures of *P. ni* were made till *after* the arrival of the vessel with *Polistes*. *P. ni* is a rare continental species, and is almost unknown in the north of Europe. An immigrant from South Europe would be most unlikely to land at the far west. All the specimens here have been taken either at the west or straggling away from it—Cornwall, Devon, Dorset, and Portland, but the metropolis is at Penzance.

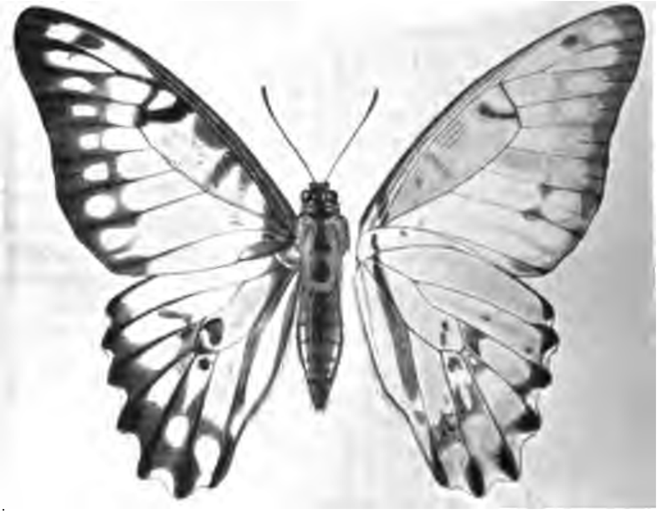
Miss Carne's specimen was caught in May, and showed that the species was double-brooded, and had been bred in the country; and Mrs. Richardson's as well as the more recent Penzance experience prove that the species breeds freely enough in this country. So that, if my surmise is correct, this *Plusia* has been an inhabitant of Penzance for nearly forty years.

In fact, I am persuaded that the North American, the British, and in all probability the European *ni* too, only from an earlier period, all hail from "the country where the nuts come from," or thereabouts.

Folkestone: Nov. 1903.

ON A NEW VARIETY OF *PAPILIO MIKADO*, Leech.

By A. E. Wileman, F.E.S.



PAPILIO MIKADO var. ALBIDUS, nov.

Differs from the type in having a creamy white ground colour, and most of the typical black eliminated. On the under side the black is confined almost entirely to the margins of the wings.

This variety of *P. mikado* was found in the province of Higo, island of Kyushu, at the end of May, 1898. It would seem to be very scarce, as only six specimens were taken, although the typical form is not uncommon in the localities where they were captured.

LIFE-HISTORY OF *ARGYNNIS LATHONIA*.

By F. W. Frohawk, M.B.O.U., F.E.S.

Although a common continental species, there appears to be no satisfactory description published of the larva or pupa either in this country or abroad, and as regards English authors, they have copied Freyer, Godart, and Sepp. The descriptions given by these three writers all vary, and not one is correct; therefore the following descriptions may perhaps be of general interest, as I have this autumn succeeded in working out all the stages of this butterfly—*A. lathonia*.

Firstly, I must mention that it is through the kindness of Mr. W. G. Sheldon that I have been enabled to do so, as he kindly sent me the only female specimen he obtained during his visit to Switzerland last summer. This he captured at Zermatt on Aug. 2nd, and at once despatched it to me, arriving on Aug. 6th. When I opened the small box containing it, I found it in a very feeble state, and one leg missing, and I must say I had very slight hope of obtaining eggs from this female, especially as she had but three legs, as I have generally found a difficulty in inducing butterflies to deposit if they have sustained injury to their legs. However, "where there is life there is hope." I immediately set to work to restore her by feeding her with sugar and water, and while she was feasting for about fifteen minutes I potted up a plant of wild heartsease (*Viola tricolor*) for her reception. Upon this I put her as soon as she had finished drinking, and placed it in the sun, when gradually she revived, but owing to the day turning dull no eggs were laid; but the following morning was bright and sunny, so I carefully watched her movements, and saw the first egg laid at 9 a.m., and by 10 a.m. she had produced about three dozen, and during the day about one hundred were deposited; these were laid singly, and mostly on the plant, but many on the gauze covering as well. I fed her again each succeeding morning, but no more eggs were deposited, and she died on the seventh day.

The egg is $\frac{1}{40}$ in. high, of a rather straight-sided conical form, widest at the base, where it is smooth and rounded off at the edge. There are about forty longitudinal keels, irregularly formed and of different lengths, some not reaching half-way up the side, and others running the entire length from base to crown, where they terminate abruptly, and form a series of triangular peaks round the summit surrounding the granulated micropyle; the spaces between the keels are finely ribbed transversely. When first laid it is of a very pale lemon-yellow colour, inclining to ochreous, appearing almost white in certain lights; the colour gradually deepens, becoming yellower with a greenish tinge. On the fifth day the crown of the egg assumes a dull grey, finally changing to a lilac-grey. All the ova hatched on Aug. 14th, remaining in the egg-state seven days.

Directly after emergence the larva measures $\frac{1}{14}$ in. long. The body is cylindrical, and the segmental divisions are deeply defined, each segment swelling in the middle. There are ten longitudinal rows of shining olive-coloured irregularly-shaped warts, five on each side, *i. e.* three above the spiracle and two below; the first dorsal and last lateral ones are bilobed; each of the lobes and the other warts bears a long serrated bristle; the longest and most curved are those on the dorsal surface; all curving forwards, the smallest being the anterior one of the dorsal pair. All these bristles are shining black, with whitish transparent tips. The head is shining black, and beset with similar but shorter bristles; the entire body is densely sprinkled with very minute black points, adding depth to the pale olive-yellow ground colour; the claspers are of the same colour, and bear a pair of simple white spines; the legs are dusky.

Shortly before first moult it measures ⅛ in. long, the ground colour is creamy white, the sides and ventral surface are mottled and chequered with pale ochreous brown, the cream colour forming longitudinal dorsal and spiracular stripes; the surface is particularly glossy.

First moult occurred on Aug. 20th.

Before second moult it measures ⅕ in. long. The shining surface of the body is covered with minute black points; each segment from the fourth to eleventh inclusive has six prominent tubercles, each set with a number of serrated bristles; these form longitudinal rows, the first being subdorsal, the others super and subspiracular; along the lateral edge and base of the claspers is another row of much smaller tubercles; the first segment has eight, the second and third segments have each ten, and the twelfth has four tubercles; all are black and bear bristles; numerous black hairs are scattered over the surface, each having a black shining base; the head, black and shining, is also beset with black bristles; there is a dorsal cluster of similar bristles in the centre of both the first and last segments. The ground colour is a pale lilac-grey, with a fine medio-dorsal stripe and an ochreous spiracular band; the subdorsal surface is chequered with blackish; the legs are shining black.

At the least disturbance they fall from the food-plant and remain rolled up in a ring for about two minutes.

On Aug. 22nd I counted ninety-two larvæ in different stages, but the majority in the second stage.

Second moult on Aug. 24th.

Before third moult it measures ⅓ in. long, being very similar to the previous stage, except the colouring is more pronounced, and the tubercles are developed into short spines, but bearing bristles as before. They are very active in their movements, running rapidly, and feed voraciously.

Third moult, Aug. 29th.

On Aug. 30th I placed seventy-three larvæ on dog-violet (*Viola canina*), but all refused to eat it, so transferred them to *V. tricolor*, when they immediately commenced feeding.

Before fourth moult it is $\frac{7}{12}$ in. long while extended crawling. The ground colour is chiefly black, with a broken double greyish white medio-dorsal line, and sprinkled all over with minute black hairs, each encircled with whitish at the base; a creamy white lateral line, on which are situated the subspiracular ochreous spines, each having a swollen bulbous deep amber base; the dorsal spines are almost black, having only the tips dull ochreous, and a smaller amount of dull amber colour on the base; the spines on the first three segments are more amber coloured than the others on the dorsal surface, resembling the super and subspiracular ones on the rest of the segments; all the spines are bristle-bearing; the claspers are ochreous; the legs and ventral surface, as well as the head, are black, but the latter is chequered with amber colour.

A large number of the larvæ moulted the fourth and last time on Sept. 1st. When fully grown it measures 1¼ in. while crawling; the body is slightly tapered, mostly so at the anterior end; each segment has two transverse wrinkles on the posterior half, the anterior half is of one plain surface; the six rows of spines are moderately long, stout at the base, and sharply pointed; all bear a number of shining black bristles; the subdorsal series are olive-brown, with ochreous brown bases; the super-spiracular series are paler brown, with amber bases, while those of the subspiracular row are wholly amber-brown, palest at the tips. The ground colour is velvety black, the spiracles are black encircled with whitish, the double medio-dorsal line is composed of two longitudinal white streaks on the anterior part of each segment, these being followed posteriorly by a double row of white warts emitting black bristles; from the base of each dorsal spine is a cream-coloured streak, and two similar streaks from the super-spiracular spines; these run over the anterior portion only of each segment from the spine to the segmental division; the subspiracular spine is situated on a buff and cream band, which, however, is clouded in the centre with dark olive; the ventral surface, like the dorsal, is black and velvety; the entire body is rather densely sprinkled with pure white minute warts, each emitting a black bristle; the legs black; the claspers dull amber-brown; the head amber on the upper half, the remainder being black, and is beset with bristles like the body.

When preparing to pupate the larva spins a considerable quantity of silk over part of the plant selected, and an ample pad of silk to grasp with the anal claspers. After hanging for about thirty hours it pupates.

During the last few days of the larval state they feed most voraciously on the bloom and leaves of both the wild and cultivated pansy, but not on either dog- or sweet-violet. I noticed they appeared to avoid the strong sunshine by sheltering on the under side of the leaves, and often selecting the most shady part of the plant to rest upon; but yet they enjoyed warmth, becoming very active and feeding rapidly on the brightest and warmest days.

The pupa measures from ⅔ in. to ¾ in. in length, the largest producing females. In structure and general formation it most closely resembles the pupa of *A. selene*. Lateral view: head rounded; thorax rounded and swollen, sloping off to the metathorax and waist; it then gradually increases in size to the third abdominal segment, from which the abdomen decreases and curves abruptly at the sixth and seventh segments, terminating in a well-developed cremaster; the abdomen is fairly straight along the ventral surface; near the apex the wing is swollen, and then runs in an almost straight line to the head. Dorsal view: the head is square, the thorax projecting and angular, indented at the waist and swollen across the third abdominal segment, then gradually tapering to a point. Colour: the head, thorax, and wings shining olive-brown; the abdomen chequered and speckled with olive-brown, ochreous, black and white; spiracles large, black, and conspicuous; on the third and fourth segments is a clouded pearly-white blotch, which spreads in the form of a large blotch over the centre of the hind margin of the wing. There are seven longitudinal rows of short, blunt, deep amber-coloured tubercles or points on the abdomen, the subspiracular series being very small; those forming the subdorsal rows are the largest; the medio-dorsal and super-spiracular ones are about equal in size; all these are surrounded at the base by whitish; the subdorsal points on the prothorax, mesothorax, metathorax, and first two abdominal segments are placed on brilliant burnished silver-gilt disks, the largest being on the metathorax; the inner margin wing-ridge is pearly whitish, the head and eye speckled with dull white; the surface is shining and covered with minute granulations, and when viewed under the microscope exactly resembles the skin of a toad, especially the wing-surface. The thoracic dorsal surface and abdomen are sprinkled with minute club-tipped bristles.

The first two butterflies (both females) emerged on Sept. 25th, followed by others on the three following days, but only ten out of ninety pupæ emerged, these being three males and seven females. Eighty of the pupæ died, although these were all fine as regards size, and apparently quite healthy at first. There is no doubt that the late autumn English climate is quite unsuited for the existence of this species, as well as it is for both *Colias edusa* and *C. hyale*, *Pieris daplidice* and *Vanessa antiopa*, apparently none of these being able to establish themselves in this country.

November, 1903.

LEPIDOPTERA REARED FROM OVA OR LARVÆ DURING THE PAST SEASON.

By F. A. Oldaker, M.A.

Broadly speaking, the year 1903 has been in my experience a disastrous one for larvæ. Quite eighty per cent. of those which have passed through my hands have died, and I cannot assign as a cause any neglect or want of precaution on my part. Food has been kept fresh, and breeding-cages have been kept clean, but the methods which in former years have succeeded admirably in most cases have failed lamentably this year. Whole broods—notably about fifty larvæ each of *Pœcilocampa populi*, *Hoporina croceago*, and *Asteroscopus sphinx*—fed up, apparently quite healthily and normally, until after their last change of skin, and then died off one by one, without a single specimen reaching the pupa.

To have been successful to any extent with only eighteen species out of a total of sixty-one, is scarcely a good record for the year, but some of the successes have gone far to make up for the failures. Six young larvæ of *Apatura iris* were sent me from Brockenhurst on May 12th; one died on the journey, and a second refused the sallow I offered it, but the other four fed up rapidly and successfully, and produced imagines—two fair-sized males on June 30th and July 1st, and two fine females on July 4th and 6th. They had pupated respectively on June 8th, 10th, 18th, and 23rd.

I experienced a fair amount of success with the larvæ of *Zephyrus betulæ*, but a good number died during the pupa stage; and I reared several specimens of *Zephyrus quercus* from larvæ beaten on Ranmore, but in this case also a great number died as pupæ, and some too before pupation. The larvæ of *Nemeobius lucina* died off in great numbers after the last moult, and about forty young larvæ of *Lycæna astrarche*, produced from ova deposited in a pill-box during the walk home from Ranmore, died off before their first moult.

Among the Sphinges I had a fair amount of success with *Sphinx ligustri*, *Chærocampa elpenor*, and *Smerinthus ocellatus*, but considerably less than in former years; and one day I found a larva in the bark of an old apple tree, which produced a very fine female *Sesia myopiformis* on July 2nd; I am led to hope that I may find a number of these larvæ in the same tree next year. *Nola cucullatella* is one of my complete failures, but *Euchelia jacobææ* was, if possible, more abundant this year than usual. At Dorking the larvæ had all gone down by the end of July, but at Bognor I noticed a lot still quite small at the beginning of September. I bred some *Arctia caia* in the hope of getting some varieties; but, though no two are exactly alike, there is no striking divergence. *Porthesia similis* I hope I have now bred for the last time, for the inconvenience caused by the urticating hairs was very great. It appears to me that one gets stung much more readily from the cocoon than from the larva. I was very fortunate with *Limantria monacha*, for, although I only got about half-a-dozen through, out of some thirty larvæ, I obtained a light and dark specimen of both male and female, the darkest male being especially fine. My disasters with *Pœcilocampa populi* I have mentioned above, and a brood of *Malacosoma neustria* behaved in a similar manner. Out of fifteen larvæ of *Gastropacha quercifolia*, kindly sent me by Mr. J. H. Carpenter, of Leatherhead, I bred thirteen fine specimens, the females especially being exceptionally large. The other two emerged from the pupæ, but were deformed. Total failures have to be recorded with *Drepana cultraria* and *Pheosia dictæa*, the larvæ in each case dying off when quite small. A number of larvæ of *Mamestra persicariæ* were found at night feeding on geraniums in the garden, and these have gone down to pupate, successfully so far as I know. Fourteen nearly full-fed larvæ of *Triphæna ianthina* were sent me from Galashiels, and everyone of these produced an imago. There is very little variation among them, though two or three are more clearly suffused with red than the others. About a dozen larvæ of *Triphæna fimbria* from Sussex produced a most interesting series of insects. One is the mahogany brown variety, two are very light, one is very dark green, and there are several intermediates, one of which is a beautiful grey-green. *Hoporina croceago*, *Xanthia aurago*, and *Cosmia paleacea* were total failures, as well as a small brood of *Polia chi* from ova laid by a var. *olivacea*. *Calocampa solidaginis* larvæ emerged from ova, but refused to eat, and *Asteroscopus sphinx*, after having caused an infinite amount of trouble in getting apple-buds, before the leaves were ready, and after thriving well right up to the last, suddenly ceased feeding and died. Six pupæ of *Plusia moneta* were sent me from the neighbourhood of Crawley, and four of these emerged. It was interesting to observe the method by which the imago clings to a twig, lying backwards with its long front legs outstretched. [See pl. iii. fig. 3, Entom. No. 483.] *Plusia chrysitis* was another total failure, but I got through five specimens out of about fifteen larvæ of *Epione apiciaria*. They are rather small, but I had failed entirely with this species last year, as I had also with *Ennomos erosaria*, which latter failure has been repeated this season. Some fine imagines of *Angerona prunaria* came through, but all the females were of the light yellow type.

The above-named are all of which I reared, or attempted to rear, any numbers, all my other records being of single specimens obtained by means of the beating-stick, or by searching, &c. They include examples of *Vanessa urticæ*, *Zygæna filipendulæ*, *Cossus ligniperda*, *Dasychira pudibunda*, *Orgyia antiqua*, *Odonestis potatoria*, *Dicranura vinula*, *Pheosia dictæoides* (of which I took a female off a lamp-post on May 31st; she deposited over one hundred ova, and the imagines were bred through by Mr. L. W. Newman, of Bexley. Several imagines appeared between August 25th and 28th, but some are standing over till next year), *Thyatira derasa*, *Acronycta aceris*, *Agrotis puta*, *Agriopis aprilina*, *Hadena pisi*, *Metrocampa margaritaria*, *Phigalia pedaria*, *Biston strataria*, and *Geometra papilionaria*.

Parsonage House, Dorking: Oct. 26th, 1903.

A LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI; WITH A FEW NOTES.

By C. Seymour Browne.

(Concluded from p. 286.)

The list which I am making from my collection is, I am afraid, more imperfect than I had previously supposed. My study of the Lepidoptera of Capri was only commenced last summer, so I have not yet had sufficient time to exhaust the resources of the island. I think, however, that the list of Rhopalocera will be found to be nearly complete, though I cannot say the same of the Heterocera, the specimens obtained having been mostly found in the daytime, or taken with an acetylene lamp at night, and again I have a considerable number of specimens that I cannot name.

Many of my specimens would probably be classified as varieties, such as those contained in my series of *Ephyra pupillaria*, but, as I am not quite certain, I prefer to err on the right side, and leave them out for the present. Having had the opportunity of examining some collections in Naples, I am certain that many more species must exist than I have been able to find.

Capri has the credit of containing a variety of *Deilephila livornica*, Esp., not to be found elsewhere; also many of the Sorrentine varieties should be found here.

The Micro-Lepidoptera are rather beyond the limits of my time and patience, but I give a list of those that I have been able to find and identify.

I need hardly say that, should any reader visit this island, I should be only too pleased for him to see my collection.

Lymantria dispar is remarkable for the way in which it resists the poison of the cyanide-bottle, and I have not found it safe to set until it has been at least two hours in the bottle.

I have never taken the female of *Arctia villica* at light, but the males have appeared in large numbers, and, although plenty of the females have been found in the daytime, I have rarely seen a male.

LYMANTRIIDÆ.

944. *Ocneria rubea*, F. (One specimen, early summer, 1908.) I have not seen this in any Naples collection.

NOCTUIDÆ.

1197. *Agrotis xanthographa*, F.

1454*a*. *Mamestra brassicæ* var. *andalusica*, Staud.

1623. *Celæna matura* Hufn. (One specimen, September, 1908.)

1765. *Aporophyla nigra* Haw.

2566. *Plusia accentifera* Lef. (Two specimens, early summer); but fairly common on the mainland.

The above six species were omitted from previous list.

GEOMETRIDÆ.

2860. *Pseudoterpna pruinata*, Hufn. Scarce.

2885. *Euchloris smaragdaria*, Fabr. Very common in summer, the females coming on later than the males, of much larger size; I have one measuring 45 mm.

2897. *Eucrostes indigenata*, Vill. Common, occuring early summer, and again in autumn, the later brood being much smaller.

2907. *Nemoria pulmentaria*, Gn. Common in summer.

2938. *Acidalia rufaria*, Hb. Can be turned out of the juniper bushes in quantities in summer.

2983*b*. *A. virgularia* var. *australis*, Staud.

3011. *A. incarnaria*, H. S. Fairly scarce, late summer.

3032. *A. filicata*, Hb. Could be taken in hundreds at light.

3043. *A. degeneraria*, Hb. Common.

3064. *A. marginepunctata*, Göze. Rather a nuisance when working with a lamp.

3066*b*. *A. luridata* var. *confinaria*, H. S. Scarce.

3093. *A. imitaria*, Hb. Common.

I have several species of *Acidalia* I cannot yet name.

3112. *Ephyra pupillaria*, Hb. Very common; shows great diversity in markings.

3115. *E. punctaria*, Linn. Two specimens, late summer, 1903.

3143. *Sterrha sacraria*, Linn. Common; much variety in colour and marking, one specimen showing a very distinct spot on each fore wing inside the stripe, other specimens mostly a pale lemon yellow with crimson stripe.

3340. *Larentia salicata*, Hb.

3344. *L. fluctuata*, Linn.

3399. *L. nebulata*, Tr.

3434. *L. galiata*, Hb.

3481. *L. bilineata*, Linn. All the *Larentia* mentioned are easy to find. I have also several as yet unnamed.

3511. *Tephroclystia oblongata*, Thnbg.

3656. *T. sobrinata*, Hb.

3707. *Stegania trimaculata*, Vill. Scarce.

3730. *Ennomos erosaria*, Hb.

3761. *Opisthograptis luteolata*, Linn. Only one specimen, 1903.

3826. *Biston strataria*, Hufn. A few specimens in spring.

3843. *Hemerophila japygiaria*, Costa. Scarce, but occurring all through the summer.

3843. *H. abruptaria*, Thnbg. About same as *japygiaria*. I have two female specimens with wavy shell-like markings on the hind wings.

3876. *Boarmia gemmaria*, Brahm.

3901. *B. selenaria*, Hb.

3948. *Gnophos variegata*, Dup.

4077. *Aspilates ochrearia*, Rossi. Common amongst the juniper.

CYMBIDÆ.

4136. *Earias clorana*, Linn.

4142. *Hylophila bicolorana*, Fuessl.

SYNTOMIDÆ.

4146. *Syntomis phegea*, Linn. One specimen, 1902.

4156. *Dysantes punctata.* Scarce, early summer; one specimen October 20th, 1903.

ARCTIIDÆ.

4168. *Phragmatobia fuliginosa*, Linn. The redness of the hind wings is much stronger than in English specimens that I have seen.

4203. *Arctia villica*, Linn.

4238. *Euprepia pudica*, Esp. Common September and October.

4248. *Callimorpha quadripunctaria* (*hera*), Poda.

4251. *Coscinia cribrum*, Linn., var. *candida*, Cyr. One specimen, 1902.

4302. *Lithosia unita*, Hb. Very common all the season.

ZYGÆNIDÆ.

4348. *Zygæna trifolii*, Esp. Will send later many additions to this family.

COSSIDÆ.

4641. *Cossus cossus*, Linn.

4718. *Zeuzera pyrina*, Linn. Very common.

PYRALIDÆ.

15. *Lamoria anella*, Schiff.
83. *Crambus pinellus*, Linn.
248. *Homæosoma nimbella*, L.
510. *Etiella zinckenella*, Tr.
645. *Salebria semirubella*, Sc.
663. *Nephopteryx rhenella*, Th.
757. *Rhodophæa suavella*, Th.
766. *Myelois cribrella*, Hb.
774. *M. umbratella*, Tr.
808. *Endotricha flammealis*, Schiff.
831. *Aglossa cuprealis*, Hb.
834. *Hypsopygia costalis*, Fabr.
836. *Pyralis farinalis*, Linn.
903. *Cledeobia angustalis*, Schiff.
922. *Cataclysta lemnata*, Linn.
930. *Stenia bruguieralis*, Dup.
949. *Scoparia ambigualis*, Tr.
984. *Agrotera nemoralis*, Sc.
998. *Glyphodes unionalis*, Hb.
1025. *Evergestis extimalis*, Sc.
1039. *Nomophila noctuella*, Schiff.
1042. *Phlyctænodes palealis*, Schiff.
1072. *Antigastra catalaunalis*, Dup.
1073. *Mecyna polygonalis*, Hb.
1151. *Pionea ferrugalis*, Hb.
1218. *Pyrausta nubilalis*, Hb.
1253. *P. aurata*, Sc.
1406. *Stenoptilia bipunctidactyla*, Hw.

DESCRIPTION OF A NEW SPECIES OF THE FAMILY *LEMONIIDÆ*.

By Emily Mary Sharpe.

Abisara huntei, n. sp.

Allied to *A. wallacei*, Hewits., but differs from that species in having a large white patch on the anal angle of the hindwing.

Forewing. Ground colour brownish black, relieved on the apical area by three medium-sized white spots, situated between the subcostal and radial nervules.

Hindwing. General colour brownish black, a large white patch on the anal angle extending along the hind margin to as far as the radial nervule; the nervules terminating in brownish black spots on the white area.

Underside. Ground colour duller brown than in *A. wallacei*, but with the greyish white lines visible on the forewing. The hindwing similar to that of the forewing in colour; the usual submarginal row of black spots is in this species represented by only three spots, extending from the apex to the third median nervule, the last of these three spots being plainly conspicuous on the midst of the white patch. The orange band only indicated between the radial nervule and the first subcostal nervule. All the nervules terminate in the hind margin in black spots. Abdomen orange-yellow as well as the legs and palpi. Expanse, 2 inches. ♂.

British New Guinea.

In the collection of Sir George Rutheven Le Hunte.

Lyndhurst, 4, Barrowgate Road, Chiswick.

CURRENT NOTES.—No. 2.

By G. W. Kirkaldy.

(Concluded from p. 287.)

A. L. Montandon (5) has given us another of his valuable essays on aquatic Rhynchota. The genus *Nepoidea* is confirmed as identical with *Curicta*, Stål, and to these is added *Helontenthes*, Berg;* *Cercotmetus* is discussed and defined; while the *Abedus-Deinostoma* group is reconsidered, Montandon confirming his original opinion that *Abedus*, *Serphus*, *Stenoscytus*, *Pedinocoris*, and *Deinostoma* are one genus only, though he makes the concession of three subgenera. Much abstruse synonymy in the *Belostoma-Zaitha* groups is elucidated, but in one point I regret I cannot follow my friend Montandon. I cannot agree to the effacement of the genus *Diplonychus* in favour of *Sphærodema*. Laporte founded the genus *Diplonychus*, with two subgenera, *Diplonychus* and *Sphærodema*. Subsequently, in the same essay, he discovered that the type of the former belonged to the latter; consequently the subgenus *Diplonychus* falls; but the subgenus *Sphærodema* is only a part (now actually the whole) of the genus *Diplonychus*, which I think ought to stand.

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* Von Ferrari and Montandon refer to this as "*Helotentes*," and other authors as "*Heloteutes*," but Berg's spelling is "*Helotenthes*."

H. J. Hansen (6) has published another of his valuable monographs on the orders of the Myriapoda, which, though not strictly entomological in the usual restricted sense of the word, are indispensable to anyone interested in the phylogeny of the Arthropoda. The treatment of the descriptions and the illustrations are in Dr. Hansen's usual well-known style. I presume the date of publication is May or June, 1903, but it is surprising that a journal of the reputation of the 'Quarterly' has indicated the date neither on any page nor on any plate, nor on the cover of the separate copy before me.

Another part of the voluminous "Species des Hymenoptères d'Europe" has appeared (10*a*). In this J. J. Kieffer continues the account of the Cynipidæ, the present fascicule comprising the Zoophaga, the Allotrinæ, and Eucoilinæ being discussed, together with a part of the Figitinæ. The first named was termed Aphidivoræ by Giraud, since its representatives live in the larval state in the body of Aphidæ or Coccidæ. They are found so far throughout the palæarctic region, while a few species have been discovered in North America. They doubtless occur also in other regions. The Eucoilinæ (Eucœlinæ) are, so far as is known, parasitic on the larvæ or puparia of Diptera, or of the larvæ of Coleoptera. The Figitinæ also are parasitic on the larvæ of Diptera, Coleoptera, and Neuroptera. The treatment is on an ample scale, consisting of systematic descriptions of all stages so far as possible, analytical keys, and biological notes, thus making the work of high interest not only to hymenopterists, but also to rhynchotists and dipterists, and, in a less degree, to specialists in other orders.

The first volume contained nearly 700 pages, with 27 plates; the second, so far as completed, nearly 300 pages, with 9 plates. The work is published in Paris, at the Libraire Scientifique A. Hermann.

E. P. Felt has published a thoroughly practical paper on the literature of American Economic Entomology (7), read before the last meeting of the Association of Economic Entomologists. Dr. Felt calculates that the enormous number of 12,163 articles on economic entomology in America alone have been issued since 1860; this including newspaper articles, reports, bulletins, &c., and being probably below the total. He places great stress on the educational value of newspaper articles carefully written by competent men, not only as a counteraction to the uninformed and frequently ridiculous attempts of the unscientific reporter, but also because he believes that newspaper articles are more generally read than the more detailed and less popular notices in reports and bulletins. A brief and interesting historical *résumé* of the history of economic literature in America concludes with remarks on indexing and ideal schemes of publication. The same author discusses (8) a number of injurious insects introduced from abroad, the depredations of some of these becoming more and more apparent and difficult to combat. Six species affecting fruit trees, two affecting shade trees, and six injuring cotton are noted as principal offenders, and many others, either minor though still sufficiently noxious, or recently introduced and probably destined to become destructive, are noted. This paper will be specially interesting to European entomologists, the species mentioned being often common though little harmful in their continent.

Dr. Felt has also (9) recently issued his fifth Report as State Entomologist of New York. This, again, is of special interest to British entomologists, one of the *pièces de résistance* being a discussion of *Euproctis chrysorrhœa*, the brown-tail moth, which has recently become established in Massachusetts, Maine, and New Hampshire. As every British lepidopterist knows, it occurs over the whole palæarctic region with but little exception. It has not yet penetrated to New York State. "It is not often that an insect is destructive to vegetation and also markedly injurious to man, and yet this is true of the above-named species. The hairs of the caterpillar of this species, coming in contact with the human flesh, produce 'a fierce and enduring irritation,' as characterized by Mr. A. H. Kirkland: and so annoying and prevalent was this that the board of health of the city of Boston gave a public hearing on the subject in 1901." The irritation is stated to be mechanical, and not due to any poisonous irritant substance in the hairs. Injurious as the depredations of *Euproctis* are, however, the American birds and insect parasites have already proved very efficient in stemming the tide; a number of birds are quoted as devouring the moths and caterpillars. Forbush recorded "the number of larvæ eaten by each bird and the time occupied. None eat less than nine, and one as many as fifty-seven caterpillars; the latter operation occupying twenty minutes." A beautiful coloured plate by L. H. Joutel shows the metamorphoses, &c., of *E. chrysorrhœa*. Among other figures are the work of *Cryptorhynchus lapathi* (Coleopt.); *Psilura monacha; Bucculatrix canadensisella* (Lepid.) and its work.

It is now more than time to notice Distant's invaluable "Rhynchotal Notes" (10), which consist of a revision of the Walkerian genera and species, with descriptions of numerous novelties from the rich collections of the British Museum and of the author himself. The families contained in the first two volumes of Lethiery and Severin's Catalogue, and about two-thirds of the third—in fact, the most recent—17th—part, completing the Reduviidæ down to the end of the Nabinæ—are dealt with. Walker fortunately described comparatively very few Miridæ, and practically no Cryptocerata, so that, although the museum collections are very rich in some of these forms, we may hope to see very soon the completion of the Heteroptera, and with the commencement of the Homoptera, in the Cicadidæ, the author falls upon one of his favourite families.

Among other recent contributions to entomological literature, which I can unfortunately notice very briefly, are:—

11. L. Zehntner: "Rapport over de mottenbestrijding of de Onderneming Banaran, 1901–1902," Proefstation voor Cacao te Salatiga, no. 5, Niewe Gids iv. afl. 11 and 12, pp. 1–53, with a graphic chart for twelve ensuing years; Apl. 1903. This discusses fully the depredations of the lepidopteron *Zaratha cramerella*, Snellen, on the cocoa plantations of Java.

12. N. Banks: "An Index to Bulletins 1–30 (new series) (1896–1901) of the Division of Entomology," U. S. Dep. Agr. Div. Entom. Bull. 36, n. s. (1902). The accuracy and usefulness of these indexes are indisputable; a slight improvement would have been the recapitulation on one page of the titles of each of the bulletins.

13. C. M. Weed & A. F. Conradi: "The Whitefly of Greenhouses," Bull. 100, N. Hampsh. Coll. Agr. Exp. Sta. pp. 45–52, figs.; March, 1903. An account of a species of the rhynchotal genus *Aleurodes;* its life-history, depredations, and control by hydrocyanic acid gas.

14. G. Del Guercio: "Contribuzione allo studio dei Diaspini dell' olivo," Bull. Soc. Ent. Soc. Italiana, xxxiv. pp. 179–188, ten text figs. (Mch. 20th, 1903). A study of certain Coccidæ of the olive [Rhynchota].

15. A. Ducke: "As especies paraenses do genero *Euglossa*, Latr." [Hymen.], Bol. Museu Paraense, iii. 561–79, plates; Dec. 1902. The bulletin of this museum contains periodical bibliographical notices of works relating to South America.

16. P. Chrétien: "Les Erebia de France" [Lep.], Le Naturaliste, xxv. pp. 71–2 (15th March, 1903). Twenty-one species credited to France.

17. H. M. Lefroy: "Scale Insects of the West Indies," West India Bull. iii. pp. 240–70 and 295–319 [Rhynch.]. The Coccidæ of the Lesser Antilles (St. Lucia, St. Vincent, Guadelupe, &c.) are discussed; the region being thought to represent a "fairly definite zoological area."

18. L. Reh: "Biologisch-statische Untersuchungen an amerikanischen Obst-Schildläuse," Zool. Jahrb. xvii. pp. 237–84,

1903. Extensive biologic-statistic researches on the American Coccids destructive to fruit.

19. W. C. Thro: "Distinctive Characteristics of the Species of the Genus *Lecanium*," Bull. 209, Cornell Univ. Agr. Exp. Sta. Ent. Div., pp. 201–21 (? *), five plates; Jan. 1903. The object of this paper is to "gain a knowledge of those external features that are available for distinguishing the [American] species" of the genus *Lecanium* [recte *Coccus*], and is based largely upon the setæ, &c.

20. J. C. H. de Meijere: "Ueber die Prothoracalstigmen der Dipteren-puppen," Zool. Jahrb. xv., Anat. Abt., pp. 623–92, four plates, 1902.

21. C. Schröder: "Die Zeichnungs-Variabilität von *Abraxas grossulariata*, L. (Lep.), gleichzeitig ein Beitrag zur Descendenz-Theorie," Allg. Zeit. für Ent. viii. (Apl. 1st, 1903), pp. 105–19, thirty-five text figs. The first part of a paper on temperature experiments on the pattern-variability of *Abraxas grossulariata*. One hundred figures are promised, of which thirty-five appear in this first instalment.

22. A. D. Imms: "*Clunio bicolor*, Kieff., marine Chironomid new to the Fauna of Great Britain," Trans. Liverpool Biol. Soc. xvii. pp. 81–6, three text figs., 1903. Supplemental to his "Notes on the Genus *Clunio*, Hal." (Entom. 1902, pp. 157–8), by an account of *C. bicolor*, which he found "skimming over the surface of the rock-pools on the shores about Port Erin, Isle of Man."

23. K. Nagano: "*Chærocampa oldenlandii*, Fab. (Sesuji-suzume)," Insect World, vii. no. 3, Mch. 15th, 1903, English suppl., one pl. with col. and plain fig. [Lep.]

24. K. Nagano: "*Protoparce orientalis*, Butler (Ebigara-suzume)," *t. c.*, no. 4, Ap. 15th, 1903, Engl. suppl., one pl. with plain and col. fig. [Lep.]

25. K. Nagano: "*Diludia increta*, Walker (Shimofuri-suzume)," *t. c.*, May 15th, no. 5, Engl. suppl., one pl. with fig.

Protoparce orientalis, which Mr. Nagano thinks identical with *Sphinx convolvuli*, is recorded from several Japanese localities, July to September. The larva is described and noted as occurring on *Ipomœa batatas*, *Calystegia sepium*, *Pharbitis hederacea*, and *Tetragonia expansa*. The *Chærocampa* is recorded from the same localities during May to June. The larva is described and recorded from *Colocasia antiquarum* and *Pinellia tuberifera*, July to September. In this number of the magazine figures appear of sexes and varieties of the Coleoptera *Lucanus maculifemoratus* and *Cladognathus inclinatus*. *Diludia increta* is recorded from Kiusiu, Shikoku, and Housiu during July and August; the larva is noted on a number of plants, July to September.

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* I have only the separate bulletin before me, and am not certain of the exact pagination.

26. A. Berlese: "Importanza nella economia agraria degli insetti endofagi distruttori degli Insetti nocivi," Boll. Scuola Agric. Portici (2)4, pp. 1–27, 1902. Berlese discusses the importance of such predatory insects as the *Coccinella*, *Cochylis*, *Pteromalus*, &c., in checking the ravages of insects injurious to crops, &c.

27. N. Cholodkovsky: "Ueber den Hermaphroditismus bei *Chermes*-Arten," Zool. Anz., 1902, pp. 521–2, three text figs. [Rhynch.] Hermaphroditism discussed in certain Aphidæ.

28. A. Porta: "Ricerche sull' apparato di secrezione e sul secreto della Coccinella 7-punctata, L." [Col.]

29. O. Schultz: "Varietäten und Aberrationen von Papilio podalirius, L., uebersicht über die Variabilität dieser species" [Lep.], Berl. Ent. Zeit. 47, pp. 117–33, 1902.

30. J. B. Smith: "Report of the Ent. Dept. of N. Jersey Agric. Exp. Sta. for 1902"; 1903, pp. i–iv and 423–593, 16 figs. (many full or double page). This is of the usual type of Dr. Smith's well-known Reports, being largely occupied by a detailed account of his mosquito experiments.

31. S. A. Forbes: "Twenty-second Report of the State Entom., Illinois"; 1903, pp. i–viii, 1–149 and i–xx, 33 figs. (many full page). This valuable Report is largely taken up with discussion of field work against the San José scale, and notices of the "Corn Bill-bugs" (*Sphenophorus* spp.), a genus of Rhynchophorous Coleoptera.

32. K. Escherich: "Beiträge zur Kenntniss der Thysanuren," Zool. Anzeiger, 14th Apl., 1903, pp. 345–66, twelve text figs. A valuable contribution to our knowledge of certain Thysanura.

NOTES AND OBSERVATIONS.

Abundance of Pyrameis cardui.—The occurrence in England of large swarms of *P. cardui* may be due, as Mr. Mathew suggests, to a prevalence of easterly gales which drive them across from Norway, Denmark, or France. But it will generally be found, I think, that when this species is exceptionally abundant in England, it is equally so on the Continent; and it is possible that the same mysterious procreative agencies may be at work in both cases. This is, I suppose, what may be called a *cardui* year, for my garden here is alive with them all day long, and on the heliotrope, covering a piece of wall ten yards long by eight feet high, I saw at 11 o'clock on the morning of Nov. 6th, at a moderate computation, between seventy and eighty at one time, the majority rather worn, but many quite fresh. The appearance of vast multitudes of certain species at irregular intervals is a problem still awaiting solution. I remember a year—'81 I think —when *Plusia gamma* lay so thick for a mile or more along the beach at Cromer that it was impossible to move without stepping on them. It has been suggested that many pupæ lie over and accumulate from year to year until some fortuitous conjunction of wind and weather starts them into life. This may or may not be the solution, but the whole subject, I think, is still shrouded in a good deal of mystery.—R. S. Standen; Villa Gaia, Bordighera, Nov. 11th.

Coincidence of Pyrameis cardui and Plusia gamma.—The abundance of *P. cardui* in most of our south-eastern counties this year has been sufficiently established by the many published notices which have appeared in this magazine and other newspapers or periodicals. Incidentally I may mention that from Sept. 23rd onward to about Oct. 16th or 17th, Michaelmas daisies in the garden here proved a great attraction to the species, which occurred in some numbers; while at Southend-on-Sea the ivy-blossom and other flowers in "The Shrubbery" were equally well patronized. This year, as on former occasions, however, I have observed that *P. cardui* has come attended by a profusion of *P. gamma;* and, curiously enough, the last great flight I can recall, *viz.* in August, 1879, was remarkable, as I find by my notes, at Hunstanton in Norfolk, for a similar coincidence there. The summer of the last year of the seventies enjoyed the reputation of one of the rainiest known; 1903 has broken the record in this respect. The interesting question therefore presents itself, how far the weather may be accountable for the visitation of *P. cardui,* and to what extent climatic conditions influence an abnormal and concurrent abundance of *P. gamma.* I have no note in this connection on 1888, another year marked as rainy beyond endurance. Perhaps some of your correspondents can furnish dates with regard to the then abundance, or otherwise, of both or either species. At present, again, we are very much in doubt as to the origin of the swarm of *P. cardui* which descended on the British coast in September, while the perfect condition of the *P. gamma* observed certainly discredits foreign origin altogether, though *Plusia* as a genus has a well-known tendency to wander. In certain parts of Holland, I understand, *P. cardui* occurred commonly enough this year, but not in such quantities as to suggest overcrowding, one of the supposed, but by no means established causes of emigration.—H. Rowland-Brown; Oxhey Grove, Harrow Weald, Nov. 10th.

Extended Emergence of Notodonta dictæa.—On Aug. 6th, 1902, I bred a large female of this species from a dug pupa. She emerged during the night, and had considerably damaged herself in the breeding-cage; so the following evening I tied her to the trunk of a poplar-tree in my garden, and next morning found her paired with a fine male, and in the course of a night or two a large number of eggs were deposited in the chip box in which she was confined. These were divided into four or five different lots, and sleeved out on poplar branches, and duly fed up and went to earth. The first moths, two in number, emerged on May 16th, 1903, and they continued to appear, by twos and threes, nearly every day until August 26th, by which time I had bred over two hundred. Rubbed females, placed out on May 25th and June 2nd, paired with wild males, and some of their progeny began to appear before all the 1902 brood had ceased to emerge. This species generally leaves the pupa between 10.30 p.m. and 1 a.m., and directly their wings are dry they become restless and fly about, and soon injure themselves; but there were exceptions, for some emerged in the forenoon, some in the afternoon, and others early in the evening.—Gervase F. Mathew; Dovercourt, Essex, Nov. 14th.

Vagaries of the Season.—Yesterday afternoon, Oct. 26th, a very fine female of *Arctia caia* emerged in my breeding-box. This was from the larva found on Sept. 21st (*ante*, p. 289).—Hugo Harpur Crewe; Stanleys, near Brockenhurst, R.S.O., Hants.

CAPTURES AND FIELD REPORTS.

Colias edusa, &c., in Cornwall.—On Sept. 14th last I saw a fresh specimen of *C. edusa* flying over the West Cornwall golf-links (Lelant), and on the 26th of the same month two more on the Hayle towans on the other side of the river, not far from the beach, and a fourth the next day in the same place.

Pyrameis cardui was common in those parts about this time. A larva of *Chærocampa porcellus* was found on the towans near the edge of the cliff. It has since become a pupa.—Harold Hodge; 9, Highbury Place, London, N.

Laphygma exigua in Yorkshire.—In 'The Naturalist' for November Mr. Thomas Fieldhouse records the capture of eight specimens of *L. exigua* near Keighley. They were attracted by his lamp when searching for the females of *Scotosia dubitata* on Sept. 22nd last. Mr. G. T. Porritt, who saw three of the specimens whilst on the setting-board, confirms the identification, and remarks that only three specimens of the species had previously been recorded as occurring north of London.

Plusia moneta in Northampton.—On July 29th a fine specimen of *P. moneta* came into my house. This capture seems interesting, as showing that the insect is gradually being distributed over the country. —H. Turner; Earl's Barton, Northants.

Plusia chrysitis in South London.—With reference to Mr. Lawrence's note on *Plusia chrysitis*, I have been in the habit of taking the species sparingly here during the last ten years; of late specimens seem to have become fewer and farther between.—Stanley A. Blenkarn; Clifton House, East Dulwich Road, S.E., October 4th, 1903.

Plusia chrysitis in South London.—I was somewhat surprised to learn from Mr. Dannatt's note (*ante*, p. 242) that it is the first time he has captured *Plusia chrysitis* so near London. For the last twenty-five years I have been in the habit of taking both this species and *Triphæna ianthina* in the garden and in Kidbrooke Lane.—Stanley Edwards; 15, St. Germans Place, Blackheath, Sept. 26th, 1903.

Acidalia straminata var. circellata in Delamere Forest. — I netted a fine specimen of the above species in Delamere Forest on July 11th last. I am indebted to Mr. Charles G. Barrett for kindly identifying this little geometer.—J. Arkle; Chester.

Abraxas grossulariata: Second Brood.—As a sequel to my paragraph of last month (*ante*, p. 289) I should like to say that I have bred in all about thirty imagines of this moth, only two or three of which exhibit any striking variation. Two specimens also I captured outdoors, and this is most interesting to me, one on November 4th, on the outside of the kitchen window, where it was fluttering towards the light of a lamp inside. The second specimen I took off the garden fence in the middle of the day, Nov. 14th, the empty pupa-case being just below it. The first was taken on a cold night, inclined to frost and fog. The second was captured on an unusually sunny and mild November day. I have tried to get eggs from some of the moths to continue breeding it, but have only succeeded in getting a few infertile ones. Four parasitic Diptera have appeared, kindly identified for me by Mr. C. Morley, of Ipswich, as *Blepharidea* (*Exorista*) *vulgaris*. This second brood of parasites also seems to me an interesting fact.—E. G. J. Sparke; Tooting, S.W., Nov. 19th.

Abraxas grossulariata: Second Brood.—I was very much interested in Mr. Sparke's note on *A. grossulariata* (*ante*, p. 289). As I have lately taken a number of pupæ here, I should like to record my experience of this somewhat unusual occurrence. I took the first lot of autumn pupæ of the species on Oct. 28th, about eighty odd. These were left in the pill-box, and on looking at them on Oct. 28th I found that one imago had emerged. From the above date, and up to Nov. 16th, I collected over five hundred and eighty larvæ and seven hundred and eighty pupæ, total one thousand three hundred and sixty. I may mention that at the time of writing most of the larvæ have pupated. One hundred of the pupæ have been placed in a perforated box outside, so as to see if the imagines will emerge naturally. All the larvæ and pupæ were taken off the currant and gooseberry bushes; in some instances as many as seven pupæ were found side by side. I may add that the first autumn brood of *A. grossulariata* that I had ever seen was in 1898, when I took over three hundred pupæ, and the old collectors here said that they had never seen the like before.—O. Tippins; The Lodge, Dingle Bank, Liverpool, Nov. 11th, 1903.

[Mr. Sich (Entom. xxx. 176) records the finding of a larva of *A. grossulariata* on Oct. 15th, 1896. This pupated on Nov. 19th, and attained the perfect state on Dec. 24th.—Ed.]

Aquatic Hemiptera in South Lancashire.—During the summers of 1902 and 1903 I have taken the following water-bugs about Bolton:—*Velia rivulorum*, Fab. = *currens*, Fab., and *Gerris lacustris*, Linn. were both very plentiful, the former on streams and the latter on ponds. *G. costæ*, H. Schf., three specimens in 1902. *Nepa cinerea*, Linn., not common, *Notonecta glauca*, Linn., and var. *furcata*, both forms common and equally plentiful in 1902, but somewhat scarce in 1903. *Corixa geoffroyi*, Leach, scarce in 1902, but exceedingly abundant last summer (August). The following species of *Corixa* were all common:—*sahlbergi*, Fieb., *mœsta*, Fieb., *nigrolineata*, Fieb., *fossarum*, Leach, and *præusta*, Fieb.; but the last mentioned was restricted to one pond, in an elevated situation. Occurring in fewer numbers were *striata*, Fieb., and *distincta*, Fieb.; while *hieroglyphica*, Duf., *linnæi*, Fieb., *fallenii*, Fieb., *limitata*, Fieb., *venusta*, D. & S., and *semistriata*, Fieb. were rare. As far as my experience goes, *semistriata* is usually a pale species, but last summer I took a specimen which was as dark as the average *fossarum*. I also had the good fortune to capture two specimens of *scotti*, Fieb.—Oscar Whittaker; 39, Clarendon Road, Whalley Range, Manchester, Nov. 12th, 1903.

Notes on Captures, 1903.—The past season has been one of the most disappointing, and one of the most unfruitful in interesting captures, that has occurred for many years, and although the neighbourhood has been worked rather more assiduously than usual, the result has been almost nil. Sugar, although persisted in with considerable regularity, has been nearly a blank, both in the variety of species and, with the exception of one week in the early part of August, in the number of insects seen. The only noteworthy captures were two specimens of *Tethea subtusa*, which is rare in this district. A rather curious occurrence was that of two *Polia flavicincta*, taken at rest on two different days on the brick pillar of a gateway in the middle of the town. This species, which we have never met with before in this neighbourhood during an experience of some fifty years, may perhaps have been recently introduced among garden plants from another district. Neither this nor *T. subtusa* is recorded in the only Chatteris list extant—that given in 'The Fenland,' published in 1878, a list to which we have been able to make a good many additions within the last few years.

Two days were spent on Chippenham Common, where the only species in any number were *Rivula sericealis* and *Catoptria scopoliana*. One specimen each of *Toxocampa pastinum* and *Bankia argentula* and a pair of *Stigmonota orobana* were taken; unfortunately the latter were hastily set down for *Dicrorampha petiverella*, a species it somewhat resembles; had its food-plant, *Vicia sylvatica*, been searched, more might have been taken. *Phytometra ænea* was fairly plentiful and in fine condition, the insects appearing a fine rich red as they flew in the sunshine.

A rough windy day at Wicken Fen was entirely unproductive, with the exception of four larvæ of *Papilio machaon*, the lovely colouring of which rendered irresistible the desire to bring them away.

A day or two's collecting in the neighbourhood of Hunstanton produced only two species we had not taken before, *Crambus fascelinellus* and *Agdistes bennetii*: two examples of the former were taken at dusk among *C. inquinatellus*, and although the sand-hills and salt-marshes were subsequently hunted indefatigably, both in the daytime and at dusk, no more specimens were met with.

Agdistes bennetii appeared on two evenings only, and seem to fly for some fifteen to twenty minutes just before dark, when they are most difficult to see. They are apparently non-existent in the daytime, and were not to be found after the moon had risen. This species also, though appearing in some numbers on these two evenings, disappeared absolutely, and, notwithstanding some hours spent in looking for them afterwards, not another one was seen.

It is a question of some interest how far the cold and wet of the past summer will affect the prospects of next season; the scarcity of the past season was to a certain extent one both of species and of individuals, for, as far as our experience went, many species which generally occur did not put in an appearance at all, and, with the exception of such common ones as *Xylophasia polyodon; Agrotis nigricans* and *Noctua xanthographa*, those which were observed were present in much smaller numbers than usual.

Thus the question arises, has the bad weather proved fatal to many insects? or are they lying over in the pupal state? This, as in the case of most other sublunary affairs, "time will show."—J. C. F. and H. F. Fryer; The Priory, Chatteris, 6th Oct., 1903.

Collecting at Chexbres in July, 1903. — Lepidoptera. — *Colias edusa*, fairly common along line of rail in the valley of the Rhone. *C. hyale*, only a few seen, one noticed in the vicinity of Bex railway station, July 7th; another captured in meadow at Brigue, July 13th; and a third (a female) at Berisal, on the Simplon, July 14th. *Pieris cratægi*, fairly common, captured at Gryon, July 7th; at Chexbres, July 11th; Brigue, July 13th; Berisal, July 14th. *P. napi*, captured one of Alpine var. *bryoniæ* of this species at Berisal, July 14th. *Leucophasia sinapis*, common along line of rail in the valley of the Rhone; also at Chexbres, July 11th, 20th, 24th; at St. Nicholas, July 22nd, 23rd. *Parnassius apollo*, two or three seen between St. Nicholas and Viege, along the mountain railway, July 23rd. *P. mnemosyne*, abundant in hay meadow close to the hotel at Berisal, July 14th. This was the first occasion on which I had ever seen this butterfly alive, and with the kind aid of the son of the vicar of Stoke-on-Trent, who was also staying in the hotel and happened to be an entomologist, I was enabled to capture a good series of the species, including five or six of its dusky var. *nebulosus*. It is decidedly feebler and slower in flight than its congener *P. apollo*, and some of the specimens proved rather worn and tattered, which circumstance is not to be wondered at, as the recorded time of its flight is during May and June. It frequently dives down to the roots of the grass if simply covered by the net without getting enclosed in the bag, a habit which I do not recall in *P. apollo*, and which should be borne in mind by those who wish to obtain this butterfly. I soon learned to distinguish it even at a distance from *P. cratægi*, which also occurred in the same field, as the latter insect is noticeably whiter, swifter in flight, and occasionally larger than *P. mnemosyne*. Several of the specimens of *P. mnemosyne* which I captured had a portion of the pupa-case still adhering to the lower end of their bodies. *Gonepteryx rhamni*, one seen at St. Nicholas, July 22nd. *Satyrus ianira*, common at Chexbres and St. Nicholas, *S. mæra*, fairly common at Chexbres and St. Nicholas and Gryon. *S. semele*, fairly common at Chexbres and St. Nicholas. *Melanargia galatea*, very common at Chexbres and St. Nicholas; does not apparently disappear so universally as other Swiss species when the grass is mown. *Argynnis aglaia*, very common, Chexbres, valley of the Rhone, &c. *A. pales*, a few in direction of Simplon Hospice, July 15th. *A. lathonia*, three specimens captured, two in the neighbourhood of Chexbres, and one in the direction of Simplon Hospice, July 15th. *Melitæa didyma*, four specimens captured at St. Nicholas, July 22nd. *M. amathusia*, one captured at St. Nicholas, July 22nd. *Chrysophanus chryseis*, one captured at Berisal and another at Gryon. *C. virgaureæ*, one captured at Berisal. *Cænonympha arcanius*, one captured in direction of Simplon Hospice. *C. pamphilus*, at Chexbres, not plentiful. *Erebia gorge*, Chexbres, not common. *Polyommatus ægon*, common along winding road on ascent to Berisal, July 14th. *P. corydon*, common at St. Nicholas, July 22nd. *P. adonis*, noticed at Chexbres, July 9th. *P. alexis*, common at Chexbres. *Vanessa urticæ* a few seen. *V. antiopa*, one fine specimen noticed flying across the road high over head in ascent to Berisal, July 14th, *V. c-album*, one noticed in neighbourhood of Chexbres. *Pamphilus sylvanus* and *P. thaumas* (*linea*), neighbourhood of Chexbres; neither of these two species abundant. *Mimois hermione*, one or two of this species noticed along mountain railway between Zermatt and Viege. *Zygæna filipendula* and *Tanagra chærophyllata* were both common at Chexbres. *Odonestis potatoria*, *Lasiocampa quercus*, *Smerinthus tiliæ*, given me by the son of my landlord, Hotel Victoria, Chexbres.

Neuroptera.—*Calepteryx virgo*, quite the commonest neuropterous insect noticed, along water-courses on either side of Chexbres railway-station, frequently settling on the hazel-bushes. *Libellula quadrimaculata*, two captured and a few more seen by shore of Lac de Bret, about two miles from Chexbres and along the road thither. *Orthetrum cancellatum*, one or two females taken in direction of Lac de Bret.

Coleoptera.—*Cetonia aurata*, very common at Chexbres and St. Nicholas, especially on the angelica; some also on roses, and others on thistles. *Melolontha vulgaris* and *M. solstitialis*, both very common at Chexbres. *Trichodis*, fairly common, Chexbres, St. Nicholas and Bex. *Carabus splendens*, five captured at Chexbres.

Hymenoptera.—*Vespa sylvestris*, becoming commoner at Chexbres as July advanced, on angelica. I may add that this year butterflies were far less plentiful at Chexbres, both in number and species, than in July, 1893.—(Rev.) F. A. Walker; Dun Mallard, Cricklewood.

SOCIETIES.

Entomological Society of London.—*October 7th*, 1903.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. F. M. Littler, Althome, High Street, Launceston, Tasmania; Mr. H. Swale, M.B., Arawa House, Rotorua, New Zealand; Colonel Jesse Griggs Pilcher, I.M.S., F.R.C.S., 133, Gloucester Road, Kensington, S.W.; Mr. S. A. Neave, B.A., Magdalen College, Oxford; and Mr. C. A. Wiggins, Kisuma, Lake Victoria Nyanza, British East African Protectorate, were elected Fellows of the Society.—Mr. G. C. Champion exhibited, on behalf of Professor Hudson Beare, some specimens of a *Ptinus* new to the British list, captured in a granary at Strood, on May 11th, 1901.—Mr. C. O. Waterhouse exhibited, on behalf of Mr. Charles Pool, specimens of a beetle of the genus *Niphus* closely resembling *N. crenatus*, but with distinct shoulders, and more parallel and less strongly striated elytra. They were found in large numbers in a corn-chandler's at Edmonton. — Mr. H. St. J. Donisthorpe exhibited specimens of *Aphanisticus emarginatus* from Parkhurst Forest, a beetle new to the British list, and a *Scymnus* new to science, from Yarmouth, I. W.—Mr. M. Burr exhibited a living adult male earwig, *Labidura riparia*, Pall., captured near Boscombe at the end of August, 1903. He said that the very noticeable pale coloration becomes darker after death, sometimes nearly black, which might account for some of the numerous "colour-varieties."—Dr. Norman Joy exhibited a specimen of *Argynnis selene*, taken last year in Berkshire, showing a remarkable tendency to melanism. He also exhibited rare Coleoptera taken in the same county during 1903.—Sir George Hampson exhibited a collection of Norwegian butterflies made by him on the Dovrefjeld, on the Alten fiord, at Bossekop and other localities this year. The specimens included fine series of *Colias hecla*, Lef., *Chrysophanus hippothoë* var. *stieberi*, Gerh., *Œneis norna*, Thnb., *Melitæa* var. *norvegica*, Auriv., the Norwegian form of *M. aurelia*, *Argynnis freija*, and *A. frigga*, a Labrador, arctic, and North American species, now found further south at Kongsvold for the first time.—Mr. A. H. Jones exhibited examples of *Erebia christi*, taken this summer in the Laquinthal, and of the species of *Erebia* to which it is allied; a local form of *Satyrus actæa*, var. *cordula*, captured last July at Sierre; and a short series of *Chrysophanus dorilis* (type) and *C.* var. *subalpina* from the Laquinthal, with *P. hippothoë* var. *eurybia*, showing the strong resemblance on the upper surface which the female of this latter species bears to the female *subalpina*.—Mr. A. J. Chitty exhibited specimens of a Proctotrupid which he said approached *Poncra constricta*, Latr., in appearance, and might be an *Isobrachium*. If so it was new to the British list.—Mr. H. Willoughby Ellis exhibited *Criocephalus polonicus*, Motsch, a Longicorn beetle new to Great Britain, from the New Forest, and also specimens of all stages from the egg to the imago, to illustrate the life-history of the species which he explained. He also exhibited *Asemum striatum*, L., with larva and pupa, accounted heretofore rare in the New Forest, but this year occurring in abundance.—Mr. Ambrose Quail exhibited cases showing the life-history of some Australian Hepialidæ.—Dr. D. Sharp, F.R.S., exhibited specimens illustrative of the egg-cases and life-history of eight species of South African Cassididæ, as described in a paper by Mr. F. Muir and himself.—Mr. W. L. Distant also showed the pupa cases of some African species of *Aspidomorpha* with the cast heads of the larvæ.—Mr. Roland Trimen, F.R.S., exhibited some cases of mimicry between butterflies inhabiting the Kavirondo-Nandi district of the Uganda British Protectorate, particularly that in which *Planema poggei*, Dewitz, is imitated by an apparent variety of *Pseudacræa künowii*, Dewitz, and also by a hitherto undescribed form of the polymorphic female *Papilio merope*, Cram. This makes the *fourth* pronounced known form of the female *Papilio merope*. The usual and generally distributed form of this sex throughout Tropical Africa is that named *hippocoon* by Fabricius—an excellent mimic of *Amauris niavius*, L.; all the other forms appear to be very rare, and two of them—*dionysos*, Doubl., and the form from Zanzibar described in the Presidential Address to the Society on January 19th, 1898—are not direct mimics of any other butterflies, but are least divergent from the non-mimetic coloration and pattern of the male.—The President congratulated Mr. Trimen on the exhibit, and the special interest attaching to an interpretation of this remarkable form of the female *merope*. At the same time he pointed out that the interpretation so convincingly illustrated that evening had been made out last spring by Mr. S. A. Neave, who exhibited this form of the female *merope* together with *Planema poggei* as its model at both soirées of the Royal Society in May and June, a time when Mr. Trimen's absence from England unfortunately prevented him from seeing them.—Dr. T. A. Chapman exhibited *Cænonympha œdipus*, *Satyrus dryas*, and *Heteropterus morpheus*, taken last summer near Biarritz; and *Erebia evias* and *E. stygne* from the Logroño Sierra, Spain. These respectively he suggested were probably examples of homœochromatism. Little attention has been directed to homœochromatism in European butterflies, and these were certainly not examples of the detailed mimetism we are now familiar with in Müllerian groups from the African and neotropical regions.—Dr. Chapman also exhibited living imagines of *Crinopteryx familiella*. These had just emerged at Reigate, where they and their parents, descended from pupæ brought from Cannes in March, 1901, had lived out of doors during their active existence, being brought into the house only during their pupal æstivation. This seemed noteworthy in so southern (Mediterranean) a species. The experiment seemed quite likely to continue successful for the next generation.—Mr. Ambrose Quail read papers "On the Antennæ of the Hepialidæ," and "On *Epalxiphora axenana*, Theyr."—Mr. Gilbert J. Arrow read a paper "On the Laparostict Lamelicorn Coleoptera of Grenada and St. Vincent, West Indies."—Mr. Thomas Harold Taylor, M.A., communicated "Notes on the Habits of *Chironomus* (*orthocladius*) *sordidellus*." Mr. F. Du Cane Godman, D.C.L., F.R.S., communicated "Descriptions of some New Species of Erycinidæ."—Mr. W. L. Distant communicated "Additions to the Rhynchotal Fauna of Central America." —Dr. D. Sharp, M.A., F.R.S., read a paper "On the Egg-Cases and Early Stages of some Cassididæ."

October 21*st*.—The President in the chair.—Mr. Montague Austin Phillips, F.R.G.S., F.R.S., of 22, Petherton Road, Canonbury, N., was elected a Fellow of the Society.—Mr. J. H. Keys sent for exhibition a black variety of *Carabus nemoralis*, Müll., from Dartmoor.—Mr. G. C. Champion exhibited a series of *Rosalia alpina*, Linn., found by himself on old beech trees at Moncayo, North Spain, in July last.—Mr. A. J. Chitty exhibited the larva of *Dytiscus flavescens*, taken at Eastling, Kent.—Col. J. W. Yerbury exhibited *Gastrophilus nasalis*, Linn., taken at Torcross, Devonshire, from the 19th to the 31st of August last. He said that as this rare species differed in a marked degree in its mode of flight, &c., from the common horse bot-fly (*Gastrophilus equi*), it would be as well to draw attention to these differences. *G. equi* when flying round a horse visits, as a rule, the belly and the fore legs. The female carries her ovipositor almost horizontal, and she looks when on the wing like the lower two-thirds of the letter *Z* (*L*). *G. nasalis*, on the other hand, carries the ovipositor tucked under the belly and almost parallel to the axis of the body; this gives her when on the wing a peculiar ball-like appearance; *G. nasalis*, too, always flies to the horse's head. As a rule, the cart-horse under observation paid no attention to *G. equi*, but *G. nasalis* caused it great alarm. The eggs of *G. equi* were in hundreds on the shoulders and fore legs; but although the face and nostrils were searched carefully, no eggs or larvæ were found thereon. Exhibiting also *Chersodromia hirta*, Walk., he said they were common on the shore near Prawle Point; some were obtained by sweeping over seaweed, while others were running about over the sand. Col. Yerbury also exhibited *Pamponerus germanicus*, Linn., from Barmouth and Porthcawl, taken in June. This insect appears to frequent the marram grass on the sandhills, and a female taken at Barmouth 27th June was preying on a beetle.—Mr. A. H. Jones, Mr. H. Rowland-Brown, Dr. T. A. Chapman, and Mr. R. W. Lloyd, exhibited specimens of the genus *Melitæa* from various European localities, and a discussion on the probable affinities of the several named species took place. — The President also exhibited some forms of *Melitæa aurinia* taken by Mr. A. H. Hamm at Basingstoke and elsewhere, and *M. athalia*, *M. didyma*, and *M. phœbe* from Asia Minor and Persia.—The President read, and commented upon, a paper received by him on "Protective Coloration in its relation to Mimicry, Common Warning Colour, and Sexual Selection," by Mr. Abbot H. Thayer.

November 4th.—The President in the chair. — Mr. W. A. Bogue, Wilts and Dorset Bank, Shepton Mallet; Mr. G. R. Baldock, 71, Hertford Road, Lower Edmonton; Mr. Robert Etheridge, Junior, Curator of the Australian Museum, Sydney, New South Wales; Mr. Charles French, F.L.S., Government Entomologist, Victoria, Australia; Mr. J. T. Houghton, Worksop, Notts; Mr. G. Lyell, Junior, Gisborne, Victoria, Australia; and Mr. William Herrod, the Horticultural College, Swanley, Kent, were elected Fellows of the Society.—Mr. H. J. Elwes, F.R.S., exhibited a small collection of North Norwegian butterflies made in July last in one day at Saltdalen, including a fine series of *Erebia disa*, *Pararge mæra*, and *Carterocephalus sylvius*.—Mr. A. J. Chitty exhibited living specimens of *Anthribus albinus*, showing the way in which this beetle mimics its surroundings.—Mr. J. W. Tutt exhibited a number of series of the genus *Melitæa* to illustrate his remarks made at the last meeting. The discussion on the affinities of the several named species was continued.—Mr. H. J. Elwes mentioned that he was at present engaged in the classification and arrangement of the Melitæas and Argynnids in the British Museum, and appealed to collectors to bring their series there to be looked over, and to present such specimens as might be useful for the completion of the group. — The President exhibited a set of 323 butterflies from British Guiana, all captured on one day, August 28th, 1903, between the ninth and tenth mile from the Potaro River to the gold-mines. The dominance of the black-hind-winged group was seen in the fact that it included no less than 295 specimens. The Ithominæ numbered 389; Danainæ, 4; and Heliconinæ, 2; a single species, *M. meme*, entirely dominating the group.—Mr. J. C. Kershaw communicated a note on the larva and pupa of *Clerome eumeus*, Drury.—Mr. W. J. Kaye contributed "A Catalogue of the Lepidoptera-Rhopalocera of Trinidad, with an appendix by G. L. Guppy."—Mr. P. I. Lathy, F.Z.S., communicated a paper "On some Aberrations of Lepidoptera." — H. Rowland-Brown, M.A., *Hon. Secretary.*

South London Entomological and Natural History Society.—*October 8th.* — The President in the chair. — Mr. F. A. Oldaker exhibited a series of *Apatura iris*, bred from New Forest larvæ; a series of *Eutricha* (*Gastropacha*) *quercifolia*, bred, from Leatherhead; a series of *Plusia moneta*, bred, from Tilgate Forest; specimens of *Lophopteryx carmelita* and *Agrotis cinerea*, from lamps at Dorking; and a specimen of *Sesia myopiformis*, from Dorking.—Mr. Bishop, a bred series of *Plusia moneta*, from Chinnor, and read notes on their life-history and on the colouring of the cocoons.—Mr. South, (1), a series of *Aglais* (*Vanessa*) *urticæ* he had bred from very young larvæ found on nettle, but which he had afterwards fed on hop; there seemed to be no particular aberrational result, but in three of the specimens the space on the costal area between the first and second black spots were of the ground colour; (2), several specimens of *Cleora glabraria*, bred from New Forest larvæ; one example was very considerably suffused and clouded with blackish; (3), a series of *Acidalia trigeminata*, bred from ova obained from a female specimen captured at Wisley; a few of the larvæ fed up in 1902, and produced moths in September; the majority hybernated, but from these only two moths resulted in June, 1903.—Mr. Tonge, series of *Conchylis dipoltella* from Brighton, *Crambus alpinellus* from Arundel, five examples of *Senta ulvæ* from near Lowestoft, one *Leucania straminea*, bred from a larva found near Lowestoft on sedge, and a specimen of *L. obsoleta* from the same place.—Mr. Goulton, photographs of the larvæ of *Odontopera bidentata*, *Jochearа* (*Acronycta*) *alni*, *Hemaris fuciformis*, *Halias prasina*, and *Phorodesma smaragdaria*.—Mr. West (Greenwich), a series of the local Hemipteron, *Aradus depressus*, from Darenth, under bark.—Mr. Carr, living specimens of *Acanthosoma tristriata*, beaten from juniper at Salisbury.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The Exhibitional Meeting was held in the Royal Institution, Liverpool, on Monday, Oct. 19th, 1903.—Mr. Wm. Webster, M.R.S.A.I. (St. Helens), in the chair.—The minutes having been confirmed, (Mrs.) F. Eveline Lister, of Bootle, and (Mrs.) Winifred M. Sopp, of Birkdale, were elected members of the Society.—Certain amendments and additions to the rules of the Society having been discussed and adopted, the following amongst other interesting exhibits were examined by the large gathering of members present.—*Aplecta nebulosa* var. *robsoni* from Delamere, by Messrs. R. Tait, Junr. (Manchester), B. H. Crabtree, F.E.S. (Levenshulme), C. F. Johnson (Stockport), and J. Collins (Warrington).—Mr. Tait further exhibited *Agrotis ripæ*, *A. ashworthii*, *A. valligera*, *A. agathina*, *Plusia festucæ*, *Zigæna minos*, *Heliothis marginata*, and some remarkably large dark forms of *Acidalia contiguaria* from North Wales, as well as living specimens of *Agrotis ashworthii*, *Aplecta occulta*, and *Acidalia contiguaria*.—Mr. Crabtree's fine series of Lepidoptera bred during 1903 included *Epunda lichenea* and *Eupithecia pulchellata* from North Wales, *E. venosata* var. *hebridium* from Shetland pupæ, *Tæniocampa opima* from Wallasey ova, and *Odontoptera bidentata* ab. *nigra* and varieties of *Abraxas grossulariata* from wild Manchester larvæ.—Mr. Johnson's valuable collection included an exceptionally fine variety of *A. grossulariata*, the ground colour of which, instead of being white, is a dark leaden colour. This insect was bred from a Warrington larva.—Mr. Joseph Collins showed series of *Cucullia* *chamomillæ* and *Hydræcia petasitis* bred from wild Warrington larvæ; *Macaria liturata*, including a fair number of the var. *nigrofulvata*, and a collection of Crambidæ embracing most of the local Lancashire and Cheshire species. — Mr. F. N. Pierce, F.E.S. (Liverpool), brought a specimen of *Sphinx convolvuli*, captured by Mr. G. Caunt at Wallasey in August last, and Mr. A. Tippins (Liverpool) exhibited *Abraxas grossulariata*, including one magnificent specimen with bright yellow ground colour, bred from a Dingle larva.—Mr. H. B. Prince's (Birkenhead) extensive exhibit included a fine series of *Nemeophila plantaginis* var. *hospita* from the Lake District; and Mr. A. G. Wallington (Warrington) showed *Mamestra abjecta* from Warrington, a species of great rarity in the district.—A collection of some four hundred species of Coleoptera from the immediate neighbourhood of Southport was shown by Dr. G. W. Chaster, M.R.C.S. (Southport), and Mr. E. J. B. Sopp, F.R.Met.S., F.E.S. (Birkdale), which included amongst its many rarities:—*Thinobius brevipennis;* the very rare *Anisotoma picea*, *A. rugosa*, and *A. furva; Heterocerus fusculus*, hitherto recorded from the Isle of Wight only; *Heptaulacus villosus; Ammæcius brevis*, an insect entirely confined to the Southport district; *Ægialia rufa;* the very rare *Anthicus bimaculatus* and *Gymnetron collinus*, &c.—Mr. Fred Birch (Wavertree) exhibited living specimens of *Chrysomela cerealis* in all its stages, and gave some interesting details of its life-history.—Mr. H. B. Prince exhibited a living specimen of *Phyllodromia germanica* from Birkenhead, which is considerably darker than the type; Mr. Sopp remarking that he had also lately received for identification the same species from the Borough hospital there. — Mr. Oulton Harrison (Wavertree) showed the *Coccus* (? sp.) commercially known as the "rosy black"; and Mr. W. H. Jennings (Hoylake), samples of liquorice root and coriander seed exhibiting the enormous damage wrought by *Anobium paniceum*, a species of beetle closely allied to the familiar "death watch" of our habitations. — E. J. B. Sopp and F. Birch, *Hon. Secretaries.*

Manchester Entomological Society.— The monthly meeting of the Society was held on October 7th, 1903, in the Manchester Museum, Owens College.—In the absence of the President, Mr. W. E. Hoyle, M.A., D.Sc., the chair was occupied by the Vice-President, Mr. B. H. Crabtree, F.E.S.—There was a very good gathering of members.—Mr. J. Leslie H. Atkinson, of Mobberley, was nominated for membership.—Mr. C. F. Johnson gave a few notes on that very interesting family, the Agrotidæ; these were overlooked by some beginners on account of the difficulty in naming the species, and their dullness of colour. Mr. Johnson briefly remarked on the British species comprised in the genus *Agrotis* (twenty-two according to South's list). Mr. Johnson's remarks were illustrated by specimens exhibited by Mr. Geo. O. Day, F.E.S., Mr. R. Tait, Jun., and Mr. B. H. Crabtree.—Various other insects were also exhibited.—Robt. J. Wigelsworth, *Hon. Sec.*

Birmingham Entomological Society.—*September* 21*st*, 1903.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed a series of *Adopæa actæon*, Rott., taken this year on the south coast; also *Dianthæcia albimacula*, Bkh., *D. cucubali* (S. V.), Fuessl, and *D. carpophaga*, Bkh., all from the same locality.—Mr. A. D. Imms, a specimen of a *Trichiosoma*, which he said he thought was different from the common *cratægi*, taken in Montgomeryshire.—Mr. Bethune-Baker, a boxful of Lycænidæ from Queensland, chiefly species which were associated with ants, and including larvæ, pupæ, and specimens of associated ants in a few cases. He gave some interesting particulars of their life-histories. He also showed a beautiful lot of Lycænidæ from Sierra Leone, which he had just received, and which included some new species.

Correction.—In the report of the meeting of this Society on Feb. 16th (Entom. xxxvi. 151), the species of *Ogyris* are spoken of as ant-feeding Lycænids. It was not meant to imply that they fed upon ants, only that they lived in association with ants; the loose expression "ant feeding," however, carries a wrong impression.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

The Butterflies of Switzerland and the Alps of Central Europe. By George Wheeler, M.A. 8vo, pp. i–vi, 1–162. London: Elliot Stock. 1903.

English collectors of Alpine Rhopalocera have long been feeling acutely the want of a new handbook which should bring together the vast amount of additional knowledge of species, varieties, and localities gathered since the publication of Kane's 'Manual.' Such information, scattered through various periodicals, was difficult of access even in the study, and, of course, never at hand in the field. Mr. Wheeler has given us a handy volume, the product of very considerable labour and large practical experience, which will be welcomed as almost entirely supplying the want. We may safely predict that every one of the annually increasing number of English lepidopterists who collect in Central Europe will carry this new work in pocket or valise. For though Switzerland receives the largest share of attention, the whole of Alpine Central Europe is included in the scope of Mr. Wheeler's excellent work, *i.e.* from the Jura on the north to the Alpes-Maritimes and Basses-Alpes in the south; and from Savoy on the west to Carinthia as far as the Julian Alps on the east of Switzerland. It will be a matter of regret to some that the Black Forest and the Bavarian Alps are not included, which geographically and in fauna seem more akin to Switzerland than, say, the Alps of the Mediterranean. But it would be ungracious to complain at the author's right of choice.

The special features of the work and Mr. Wheeler's aims are clearly and succinctly set forth in the Introduction. It is a pity that the method adopted does not include a description of each species, so that, at least for beginners, some other guide, such as Kane's, is still a necessity. But the prevailing colours of each tribe or genus are given, and often a distinguishing character of the latter; then, under each species, the synonyms, size, food-plant, and the superficial differences between male and female are noted, and one or more characteristics given by which each may be distinguished from its neighbours. These "distinguishing characteristics" are presented in a novel manner, and form a most valuable aid to the ready identification of specimens, which will be much appreciated. They have been carefully worked out, and are evidently the result of original study (in most cases) of a long series of specimens, and of a habit of minute and accurate observation. Sometimes these "Dist. Char." might perhaps have been made more clear and convincing, if a fuller general description of the species had preceded them. Next follows a list of "localities," which in nearly all instances is very full, precise, and up to date. Under the head "Directions of Variation" we have another excellently performed piece of work, which indirectly, to some extent, makes up for the omission of a full description of the types. Mr. Wheeler has partly avoided the modern craze to exaggerate trifles, and to exalt the inevitable differences between almost every individual of many species to the dignity of named varieties.

His method is to mention the "directions of variation" in colours, markings, &c., and to tell us how each of these culminates in such and such named varieties. Many new and most interesting varieties are described by him for the first time, and many more for the first time in English. Yet among the "blues" we notice at least two omissions which surprise us. Is it possible that the beautiful blue form of female *Rusticus* (*Lycæna*) *argus*, L. (*ægon*, Schiff.), known to us as ab. *corsica*, does not occur in the Central Alps? Again, under *Polyommatus* (*Lycæna*) *corydon* there is no mention of *corydonius*, unless he has included such forms under ab. *pallida*, Tutt. Mr. F. Rosa mentions *corydonius* from Pfyn, July, 1900 (Entom. xxxv. 96), and other captures have been recorded. The author has always the courage of his opinions, and runs a tilt against one or two notable lepidopterists in the matter of classification and nomenclature. He has abandoned the claim of *berisali*, Rühl (*berisalensis*, Fav.), to rank as a species, in favour of making it a variety of *M. deione*, and merged *alcyone*, Schiff. as a var. of *Satyrus hermione*; separated *S. cordula* from *actæa* and *Anthocharis simplonia* from *A. belia*. He also refuses var. *ausonia* a place among the inhabitants of the Valais. Probably it will be proved that he is justified in all these points, but it would have been interesting to have had his reasons for the position he assigns to *Libythea celtis*. We should not have regarded hedges and copses as the haunt of *Neptis lucilla*, but perhaps it is as true as the old superstition of "chestnut forests" being the peculiar habitat of this species. Mr. Wheeler has, however, given us a trustworthy and original book, for the making of which he has had the special qualification afforded by long residence in Switzerland, and the advantage of the friendship and assistance of both English and Swiss entomologists of repute, whose help he most handsomely acknowledges. All collectors will appreciate the "Geographical Index of Localities" with which the book concludes.

Obituary.—We regret to hear that Dr. Philip Brookes Mason, of Burton-on-Trent, died on Nov. 5th last.

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EXCHANGE.

Duplicates.—Atalanta,* Io,* S. Populi* (4), Salicis,* Similis,* Filipendulæ,* Megacephala,* Arcuosa, Lunosa (variable), Doubledayaria,* Strataria,* Hirtaria,* Tetralunaria* (6), Tenuiata,* Oblongata,* Linariata* (6), Unifasciata* (6), Decolorata.* *Desiderata.*—Confusalis, Senex, Aceris, Venosa, Rufa, Blanda, Chrysozona, Contigua, Genistæ, Rectilinea, Socia, Venustula, Limbaria, Immutata, Rusticata, Satyrata, Castigata, Pygmæata, Plumbeolata, Coronata, Sexalata, Viretata, Simulata, Rivata, Berberata, Certata, Rhamnata, Associata, Umbra, Tripartita, Fontis, Sericealis, Cribralis, Turfosalis.—*John Taylor:* 318, *Chadderton Road, Oldham.*

Duplicates.—Rhizolitha, Chrysorrhœa, Actæon (2, females), Puta, Trilinea (8), Protea, Suffusa, Upsilon (3), Vaccinii, Festiva, Lota, Macilenta, Rufina, Pistacina, Spadicea, Aprilina, Ferruginea, Tenebrosa (1), Dilutata. *Desiderata.*—Very numerous.—*R. V. Solly;* 40, *Southernhay, Exeter.*

Duplicates.—Sibylla, Selene, Euphrosyne, Russula, Prasinana, Derasa, Batis, Exclamationis, Turca, Rufina, Aprilina, Oxyacanthæ, Undulanus and var. Ramosana, Roboraria, Repandata, Prosapiaria, Erosaria; also pupæ of Rubricollis, Camelina, Pudibunda, Prasinana, Betularia, Jacobææ. *Desiderata.*—Numerous, particularly ova and pupæ.—*E. Morris; Brockenhurst.*

Duplicates.—Venosata and var., Linareata, Pulchellata, Centaureata, Subnotata, Lariciata, Tenuiata, Abbreviata, Nanata, Plumbeolata, Vulgata, Albipunctata, Virgaureata, Pygmaæta, Satyrata, &c. *Desiderata.*—Very numerous, including Pennaria, Dolobraria, Hispidaria, Abietaria, Hexapterata, Inornata, Procellata, Quadrifasciaria, Certata, Picata, Cespitis, Furva, Connexa, Unanimis, Blanda, Obelisca, &c.—*John E. Robson;* 15, *Northgate, Hartlepool.*

Duplicates.—Oxyacanthæ var. Capucina,* Illustraria,* Angularia,* Pudibunda* (females), T. W-Album,* Io,* Castrensis,* Monacha,* Polychloros,* Cervinata,* E. Autumnaria,* Aversata,* Ægon var. Corsica, Nigra, Littoralis, Valligera, Ægon. *Desiderata.* — Ova: Cratægi, Curtula, Prunata, Pyraleata, Associata, Testata. Pupæ: Furcula, Dictæa, Dictæoides, Dodonea, Or, Ridens, Prodromaria, &c. Accepted offers answered by return.—*Colonel Partridge;* 72, *St. John's Park, Blackheath, S.E.*

Duplicates.—Pupæ of Anachoreta. *Desiderata.*—Other pupæ; imagines of Selene, Cinxia, Athalia, Cassiope, Egeria, Rubi, Malvæ, Comma, Palæmon, and many common Heterocera.—*H. B. Browne; Hymer's College, Hull.*

Duplicates. — Taken in Co. Waterford: Brassicæ,* Napi, Rapæ, Cardamines, Sinapis, Edusa, Urticæ,* Io,* Atalanta.* Argiolus, Icarus, Egeria, Paphia, Tithonus, Hyperanthus, Semele, Populi,* Gothica (vars.), Cruda, Stabilis, Instabilis, Polyodon, Quadra,* Vinula, Menthastri, Antiqua, Hectus (vars.), Prunaria, Populata, Montanata, Dolobraria, Bilineata, Petraria, Atomaria. English: Polychloros,* Sibylla, Ligustri,* Pinastri* (2), Chrysidiformis.* *Desiderata.*—Exulans, Bicolorana, Cucullatella, Albulalis, Centonalis, Senex, Muscerda, Lutarella, Griseola, Deplana, Sericea, Sylvanus, Pyrina, Cratægi, Castrensis, Versicolor, Furcula, Bifida, Plumigera, Palpina, Camelina, Cucullia, Carmelita, Dromedarius, Trilophus, Trepida, Chaonia, Trimacula, Or, Duplaris, Fluctuosa, &c.—(*Rev.*) *W. W. Flemyng; Coolfin, Portlaw, Co. Waterford.*

Duplicates. — Large numbers of Exotic butterflies. *Desiderata.* — Exotic butterflies.—(*Rev.*) *W. W. Flemyng; Coolfin, Portlaw, Co. Waterford.*

Duplicates.—Asinalis, Prunalis, Galactodactyla, Lithodactyla, Pastinum, Oxyacanthæ, Aurago; also larvæ of Pastinum. *Desiderata.*—Numerous.—*Williams; 'Observer,' Penarth.*

Duplicates.—Albicillata, Zonaria, Elinguaria, Maculata, Strigillaria, Fumata Dentina, Menyanthidis, Perla, Statices, Russula, Jacobææ, Plantaginis var. Hospita, Mesomella, Selene, Io, Cassiope, (Davus var. Rothliebi). *Desiderata.*—Numerous.—*H. Phillipson;* 2, *Waveney Villas, Park Lane, Romford, Essex.*

Duplicates.—Lepidoptera from Italy, India, Australia, North America, Peru' including many fine rare species. *Desiderata.*—European and Exotic butterflies. *Roger Verity;* 1, *Via Leone Decimo, Florence, Italy.*

Duplicates. — Autumnaria* (Folkestone). *Desiderata.* — Numerous; many common species to renew and extend. Good specimens, black pins.—(*Miss*) *A. D. Edwards; The Homestead, Coombe Hill, East Grinstead.*

Duplicates.—O. Autumnaria and ova.—*J. E. R. Allen; Portora, Enniskillen, Ireland.*

Duplicates.—Dominula,* Caja,* Hera (3), Litura, Ianthina, Typica,* Triangulum, Satellitia,* Aurago (8, white pins), Fimbria,* Proteus, Saucia, Z. Trifolii,* Trapezina, Porphyrea,* Petrificata (4, white pins), Glareosa. *Desiderata.*—Numerous imagos, larvæ or pupæ.—*J. Walker; 3, Goodwin Terrace, Bronshill Road, Torquay.*

Duplicates.—Sinapis, Palpina, Oxyacanthæ, Parthenias, Falcataria, Ocularis (fair), Nupta, S. Populi, Tiliæ, Pyrina, Flavicornis, Aceris, Megacephala, Quercinaria, Hirtaria, Betularia, Abruptaria, Gemmaria, Leucophæaria, Æscularia, Sordidata, Populata. *Desiderata.*—Numerous.—*A. W. Copper; 43, Charlotte Street, Portland Place, London, W.*

Duplicates.—Machaon, Edusa, Galatea, Convolvuli (1, chipped), Ligustri, Elpenor, Ocellatus, Populi, Tiliæ, Stellatarum, Monacha (one black var.), Ligniperda, Versicolor (one female, four males), Furcula (2), Bifida (1), Diluta (2), Megacephala, Psi, Triangulum, Umbrosa, Nictitans, Pyramidea, Flavocincta, Exoleta. Cassinea, Nupta, Apiciaria, Syringaria, Liturata, Sylvata, Piniaria, Bicolorata, Albicillata, Derivata, Quadrifasciaria, Antherea, Pernyii (3). *Desiderata.*—Pinastri, Galii, Euphorbiæ, Hera, Russula, Fuliginosa, Chrysorrhœa, Fascelina, Lanestris, Rubi, Batis, Ridens, Orion, Illustraria, Hirtaria, Adustata, Galiata, Plumbaria, &c.—*J. Coward; Haverholme, Sleaford.*

Duplicates.—Unca, Fuscula, Palpina (3), Cucubali, Albicolon (4, fair), Satellitia, Protea, Morpheus, Ferruginea, Capsophila, Capsincola, Suasa* (4), Leucophæa (fair), Anomala, Miniosa (4), Upsilon (4), Cerago,* Silago,* Croceago (6), Umbratica, Duplaris (3, dark), Lutulenta (2), Nebulosa, Baja, Verbasci* (4), Camelina, Orion* (2), Cæsiata, Ianthina,* Aprilina, Literosa, Nictitans, Gemina, Comes, L. Comma,* H. Sylvinus, Umbrosa, Fulva, Suffusa, Lignata,* Cæsia (4, fair). Piniaria,* Russula,* Subfulvata,* Rivata,* Autumnaria,* Tiliaria,* Quercinaria,* Immutata, Ulmata, Boreata, Pudibunda,* Pavonia (males), Vespertaria (males), Rusticata, Trigeminata, &c. *Desiderata.*—Globulariæ, Myopiformis, Petasitis, A. Ligustri, Ulvæ, Pyrina (females), Auricoma, Rufa, Pastinum, Connexa, E. Extersaria, T. Cratægi, Ridens, Strigula, Chaonia, Leporina, Venosa, Coronata, Virgaureata, Pygmæata, Oo, Togata, Rubiginea, Semibrunnea, Tæniata, &c.—*T. Ashton Lofthouse; The Croft, Linthorpe, Middlesbrough.*

Duplicates.—Fresh, well-set, ou black pins.—H. Comma, Galatea, Semele, Loniceræ, Filipendulæ, Corydon, and pupæ of Pisi. *Desiderata.*—Cinxia, Betulæ, C-Album, Polychloros, Sibylla, Epiphron, Davus, W-Album, Paniscus, Actæon, Statices, Mundana, Irrorella, Miniata, and many common Noctuæ to renew.—*F. Parry; 13, Longport, Canterbury.*

Duplicates.—P. Machaon, Aurinia (Irish and Kentish), Euphrosyne, Selene, Paphia, Bellargus, Corydon, Astrarche, Argiolus (few), Galatea, Thaumas, Sylvanus, Tages, Bombyliformis (3, moderate), Lineola (moderate), Gilvaria (few). *Desiderata.*—Senex, Deplana, Complana, Fascelina, Coryli, Lanestris (female).—*Percy E. Freke; South Point, Lime's Road, Folkestone.*

Duplicates.—T. Quercus,* Fimbria,* Vinula, Pudorina, Comma, Satellitia. Nictitans, Flavicornis (2), Nupta (2), Upsilon (3), Gilvago,* Pinastri, Viminalis, Plecta, Mendica,* Megacephala, Silago,* Cerago,* Typica, Rubricosa, Cruda, Cassinea (2), Autumnaria,* Angularia,* Prodromaria* (fine), Taminata, larvæ of C. Cythera. *Desiderata.*—Chaonia, Ni, Præcox, Oo, B. Rubi, Agathina, Fluctuosa, Pruni, A. Ligustri, and many others. All specimens to be perfect. Lists exchanged.—*W. E. Baker; Tilney All Saints, King's Lynn.*

Duplicates.—A few each—Sinapis, Cæruleocephala, Oxyacanthæ, C-Nigrum, Testacea, Flavago, Impura, Bicoloria, Trigrammica, Ulmata, Rupicapraria, Advenaria, Trilinearia, Bicolorata, Decolorata,. *Desiderata.*—To renew—Minima, Dromedarius, Popularis, Coryli, P. Populi, Persicariæ, Leucostigma, Literosa, Nigricans, Tritici, Triangulum, Umbrosa, Dissimilis, Piniperda, Cucubali, Viminalis, Vetusta, Argentula, Cinctaria, Viridata, Amataria, Exanthemaria, Belgiaria, Rurea, Graminis, Diffinis, Verbasci, Flavicincta, and many others.—*H. A. McNaught; 2, Chatley Villas, Claines, Worcester.*

Duplicates.—Miniosa, Variata,* Extersaria,* Syringaria,* Rubricosa, Instabilis, Fasciaria,* Consortaria, Fimbria,* Sibylla,* T. Quercus,* Polychloros,* Paphia, Palumbaria,* Quadra,* Monacha,* Hyperanthus, Neglecta,* Glabraria,* Auroraria, Rufina, Aprilina, Rhizolitha, Cardui, Cystisaria,* Valesina (fair), Cinctaria (few). Pennaria (males), Moneta* (4); also pupæ; Munda, Undulata, Piniaria. *Desiderata.*—Nnmerous: also pupæ of many species.—*L. F. Hill; 2, Freelands Road, Bromley, Kent.*

Duplicates.—Fine Eup. Extensaria,* Quercana* (a few), Quadrifasciaria (a few). *Desiderata.*—Fine Iris, Apiformis, Scoliiformis, Bombyliformis, Rubricollis, Testudo, Degeneraria, Consignata, Irriguata, Togata, Tæniata, Fluviata, Lapidata, Chaonia, Dictæoides, Fagi, Strigosa, Auricoma, Fluctuosa, Cinerea, Caliginosa, Nigrocincta, Cæsia, Chamomillæ, Conformis, Bractea, Venosa, Nubeculosa, Cannæ, Ashworthii, Atriplicis, Leucophæa, Semibrunnea, Bifida, Lychnitis, Peltigera, Armigera, Alpina, Conspicillaris, Dentalis, &c.—*E. A. Atmore; King's Lynn, Norfolk.*

Duplicates.—Sinapis, Polychloros, Quercus, Stellatarum, Geryon, Spartiata, Camelina, Dispar, Moneta, Valligera, Littoralis, Suffusa, Diluta, Pyramidea, Absinthii, Hera. Only accepted offers replied to.—*(Rev.) J. S. Puckridge; Castlemartin Vicarage, Pembroke.*

Duplicates.—Io,* Cardui, T. Quercus, Monacha,* Quadra,* B. Quercus, Salicis,* Pilosaria (males), Obscurata, Emutaria, Leucophæaria (males), Firmata, Variata, Abbreviata, Unangulata,* Batis, Hepatica, Nebulosa, &c. *Desiderata.*—Athalia, C-Album, Pruni, Globulariæ, and many others. Black pins: data.—*A. M. Smallpeice; Field Lodge, Burley, Ringwood, Hants.*

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Changes of Address.—R. Tait, Junr., *from* Crumpsall, Manchester, *to* Roseneath, Harboro' Road, Ashton-on-Mersey, Cheshire. — G. W. Kirkaldy, *from* Worple Road, Wimbledon, *to* Department of Agriculture and Forestry, Honolulu, Hawaiian Islands.—A. Lionel Clarke (Naturalists' Agent), *from* Barton Street *to* Stroud Road, opposite Post Office, Gloucester.—H. Wood, *from* Old Grammar School *to* 9, Church Road, Ashford.

Entomological Society of London (11, Chandos Street, Cavendish Square, W.). Wednesday, December 2nd, 1903, at 8 p.m.

South London Entomological and Natural History Society (Hibernia Chambers, London Bridge, S.E.).—Meetings on the 2nd and 4th *Thursdays* in each month at 8 p.m.

To Correspondents.—All notes, papers, books for review, &c., and notices of exchange should be sent to the Editor—

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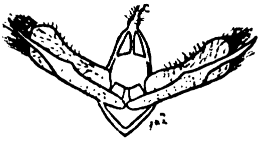
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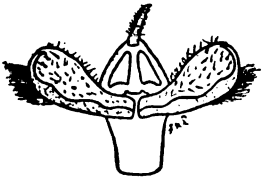
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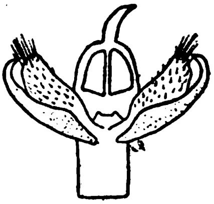
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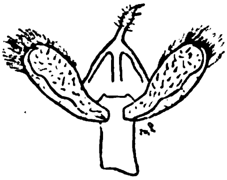
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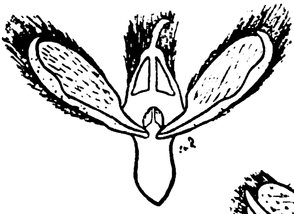
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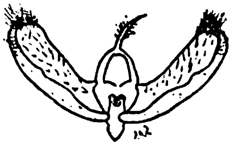
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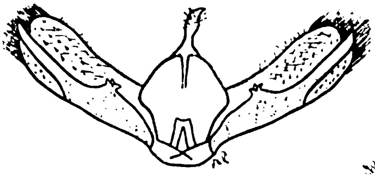
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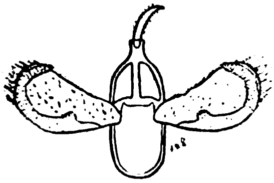
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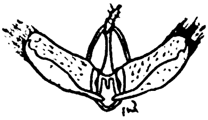
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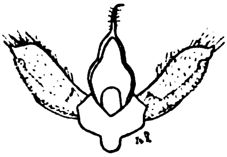
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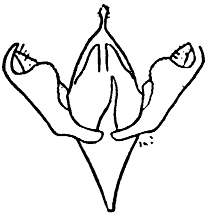
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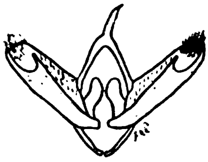
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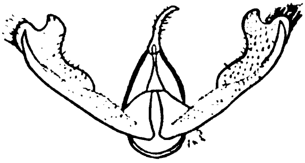
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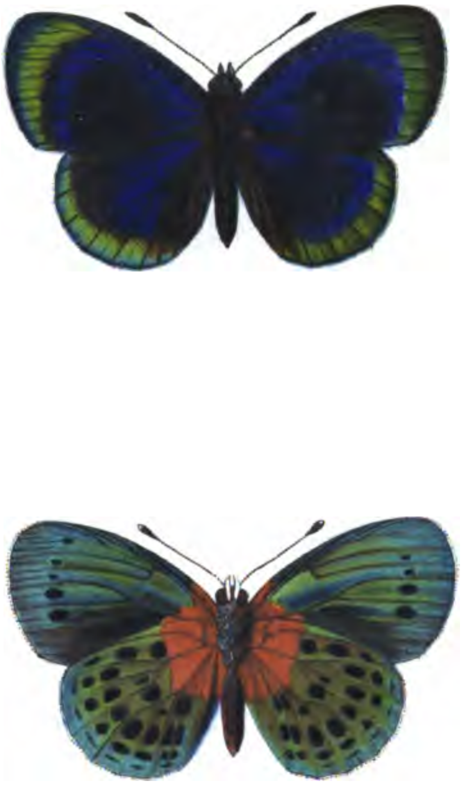
West, Newman imp.

Structure of Genitalia in Lithosidæ.

Entomologist, May, 1903. Plate II.



West, Newman chromo

Callithea adamsi, *sp. nov.*

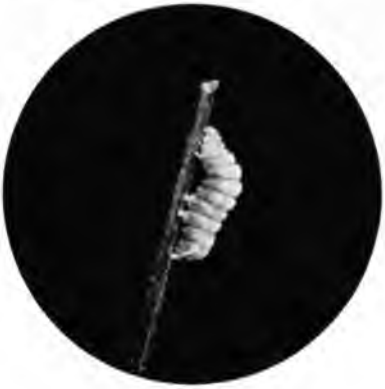


Fig. 1.

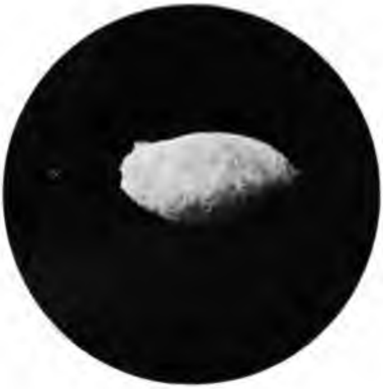


Fig. 2.

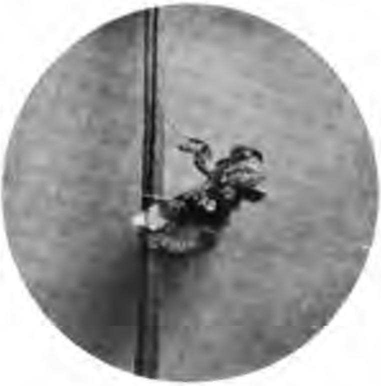


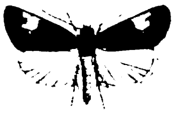
Fig. 3.

PLUSIA MONETA.

1. Larva. 2. Cocoon. 3. Imago.

(From photographs taken by H. W. Shepheard-Walwyn, F.Z.S., F.E.S.)

Entomologist, Sep., 1903. Plate IV.



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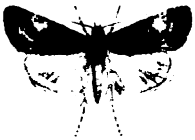

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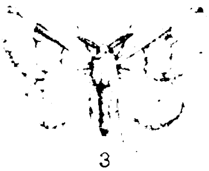

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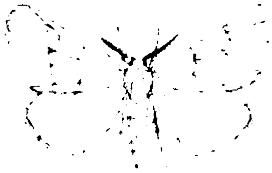

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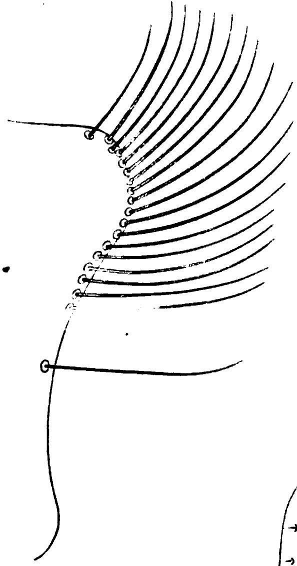
F W Frohawk del et lith West, Newman imp

1♂, 2♀ Metachrostis costiplaga.
3♂, 4♀ Xenobiston casta.

Entomologist, Dec. 1903. Plate V.



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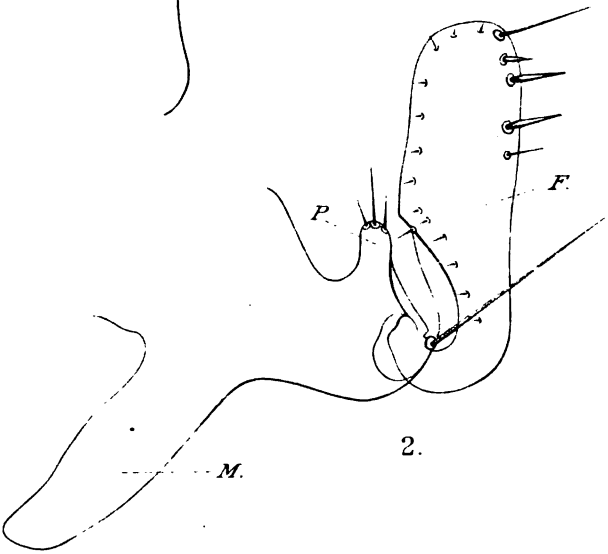

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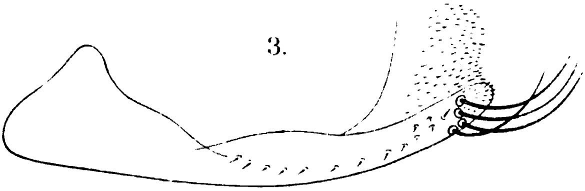

West, Newman lith.

Ceratophyllus dalei *Roths.*

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